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As part of this report, hazardous waste program priorties are described as well as a discussion of program challenges emanating from comprehensive and far reaching Hazardous and Solid Waste Amendments of 1984.

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Report to Congress

EPA Activities and Accomplishments Under the Resource Conservation and Recovery Act: Fiscal Years 1980 to 1985

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EPA ACTIVITIES AND ACCOMPLISHMENTS UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT: FISCAL YEARS 1980 TO 1985

Prepared by the
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

July 1986

1-2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 11 1986

THE ADMINISTRATOR

Honorable George Bush
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

I am pleased to transmit the Report to Congress on "EPA Activities and Accomplishments Under the Resource Conservation and Recovery Act: Fiscal Years 1980 to 1985," pursuant to Section 2006 of that act.

This Report describes the regulatory development and implementation activities accomplished by EPA during the past five years. This time period is important to the overall history of the program because during these years, EPA developed the foundation for the regulatory program that is now being implemented by the regulated community, the Regions and the States.

As part of this Report, hazardous waste program priorities are described as well as a discussion of program challenges emanating from the comprehensive and far reaching Hazardous and Solid Waste Amendments of 1984.

The Report and appendices are transmitted in one volume.

Sincerely,

Lee M. Thomas

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 11 1986

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Honorable Thomas P. O'Neill
Speaker of the House of
  Representatives
Washington, D.C. 20515

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Sincerely,

Lee M. Thomas

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FOREWARD

This report was prepared by the Office of Solid Waste, the United States Environmental Protection Agency, with support from a contractor, Putnam, Hayes and Bartlett. The EPA manager was Jim O'Leary with technical guidance and review provided by Marcia E. Williams, Director of the Office of Solid Waste. In addition, Lorna L. Holloway and Joan O'Callaghan assisted in the production of this report.

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EXECUTIVE SUMMARY

The Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA) set forth the legislative authority to further the national policy of (a) reducing or eliminating the generation of hazardous waste as expeditiously as possible, wherever feasible, and (b) treating, storing, or disposing of waste in a way that minimizes the present and future threat it may pose to human health. These Acts identify a number of specific programs and activities that must be conducted to achieve their objectives and designate the U.S. Environmental Protection Agency (EPA) as the organization at the federal level with the responsibility and authority to carry out their mandates.

Following is a summary of the accomplishments of EPA's programs in response to RCRA and HSWA, the priorities that EPA's hazardous waste program has set for the near term, and the challenges EPA will face in implementing HSWA.

SUMMARY OF PROGRAM ACCOMPLISHMENTS

Background

The Resource Conservation and Recovery Act (RCRA) required EPA to develop and implement the hazardous waste regulatory program. In many ways, RCRA was unique among major federal environmental acts. First, unlike a number of other acts that focused on end-of-pipe controls, the hazardous waste regulations covered the entire life cycle of hazardous waste from "cradle to grave." Furthermore, the nature of hazardous wastes varies widely among generators, and the potential for the creation of environmental problems is extremely difficult to determine and control, given the present state of technical knowledge. Thus, hazardous waste regulations have had to be both comprehensive in coverage and complex in technical detail.

Second, an unusually large number of facilities, each with features presenting unique environmental and health risks, were to be covered by standards that would apply to all facilities. Thus, the challenge to develop regulations that were universally applicable, easily understood, enforceable, and that also recognized the significant differences among facilities was particularly great.

Finally, the federal hazardous waste program had to be developed essentially from scratch. Little previous experience existed at the federal level, and very few states had developed hazardous waste programs that were anywhere near the scope and stringency of the program envisioned by RCRA.

Accomplishments of the Regulatory Program through 1985

From 1980 to 1985, EPA put into place a hazardous waste regulatory effort that responded to all aspects of the RCRA legislation. The development of the "core" program occurred in two phases. During 1980, the Phase I program was promulgated. This phase contained regulations concerning the identification and listing of hazardous waste, setting forth standards for hazardous waste generators and transporters, setting forth permitting procedures, and providing requirements and procedures for the federal authorization of state programs. In recognition of the fact that numerous technical complexities and risk-oriented issues would delay the promulgation of requirements and issuance of permits for hazardous waste management facilities, the Phase I regulations also contained requirements for facilities to operate under interim status. Phase II regulations, or the remainder of the core program, were promulgated during 1981 and 1982. These regulations defined the technical and financial responsibility requirements, and set forth the technical standards for storage and treatment facilities, incinerators, and land-disposal facilities.

Subsequent regulatory efforts before the 1984 promulgation of the Hazardous and Solid Waste Amendments (HSWA) have served to modify, clarify, or expand upon the initial core program to improve its ability to respond to the legislative objectives. HSWA has already resulted in several major changes in the regulatory framework, including the codification of 25 HSWA provisions on July 15, 1985.

Since the beginning of 1986, the Agency has issued its proposal for restricting the land disposal of untreated wastes for dioxins and solvents; issued waste-as-fuel administrative standards, and the final rule for hazardous waste tanks; promulgated the final rule for small quantity generators (SQG); and issued the final rule to streamline EPA approval of State program revisions. (See Appendix A for a detailed list of recent outputs.)

Accomplishments of the State Authorization Program through 1985

The 1976 Resource Conservation and Recovery Act that amended the Solid Waste Disposal Act placed a major emphasis on the partnership between the federal government and the states in implementing the Subtitle C regulations. EPA's objective is to have states conduct as much of the hazardous waste regulatory program as possible. These responsibilities include defining which wastes are hazardous; conducting the manifest program for generators and transporters; permitting treatment, storage, and disposal facilities; and enforcing compliance with the regulations.

The process of granting state authorization began in 1980, when EPA promulgated the Phase I regulations. Over half of the states received interim authorization for this part of the regulatory effort within the next two years, and ultimately 45 states received Phase I interim authorization. In 1982, EPA began authorizing states to implement their regulations for storage facilities (Phase IIA) and incinerators (Phase IIB). Authorization for Phase IIC covering land-disposal facilities began in 1983. By the end of 1984, 25 states had received interim authorization for part or all of the Phase II program. In that year, EPA began granting final authorization for the pre-HSWA regulatory program. By June 1986, 41 states had received final authorization. Of the others, seven had submitted applications, leaving only six outside of the final authorization process. Of these six, only Hawaii, Wyoming, and the Virgin Islands had expressed the intent not to adopt the RCRA program.

As a result of federal funding and guidance, nearly all the states have regulatory programs that equal or go beyond the pre-HSWA federal RCRA program in breadth and stringency. Perhaps as significant as the number of states authorized is the improvement in the caliber of state programs over the years. The number of personnel responsible for implementing these programs has greatly increased during this period, and the experience and technical expertise of program personnel have greatly improved as a result of the authorization and implementation process.

Accomplishments of the Permitting Program through 1985

During its relatively brief existence, the RCRA permitting program has had a number of major accomplishments. As part of the state authorization effort, a viable federal-state partnership has developed in the area of permitting. Working in concert with the authorized states, EPA has made significant strides in identifying the universe of sites to be regulated and bringing them into the final permitting process.

As of June 1986, EPA had identified a total of 4,134 facilities requiring operating permits and, working with the authorized states, had received Part B applications for over 46 percent of that universe, including applications for 100 percent of land-disposal facilities. Of the 1,290 facilities subject to ground-water monitoring, 88 percent had well systems in place. In addition, the permitting process had resulted in the exodus of almost 2,700 facilities from the hazardous-waste-handling industry. Some of these facilities had filed unnecessarily as hazardous waste management facilities, but many were not environmentally sound. Another major accomplishment of the permitting program has been the development of a staff at state and regional levels that is capable of dealing with the multidisciplinary complexities of the permit review process and is able to develop permits that respond to past problems and minimize the risk of future problems.

Accomplishments of the Compliance Monitoring and Enforcement Program through 1985

Since the 1980-1982 promulgation of the core RCRA program, EPA developed almost from scratch a fully implemented compliance monitoring and enforcement program. Largely through the efforts of a RCRA unit that became part of the Office of Waste Programs and Enforcement in 1983, EPA has produced substantial legal, technical, and organizational guidance that has enabled the development of a cohesive and focused enforcement effort at state, regional, and federal levels.

As the program has evolved, there has been a growing recognition that efforts should target major facilities with violations that ultimately threaten ground-water supplies. As a result, inspection programs, which have increased in sophistication over the years, have been more effective in identifying such violations, and enforcement efforts backed by an effective penalty program have systematically addressed major facilities with major violations and returned many of them to compliance. However, the continued existence of widespread non-compliance by the regulated community will require the continuation of a highly directed and highly visible enforcement presence.

Non-Regulatory Accomplishments

While much has been accomplished over the last several years, probably the most important accomplishment has been the level of consciousness that has been raised in the regulated community and by the general public to foster better hazardous waste management practices. Major in-house programs have been instituted by private firms to manage hazardous waste, including waste minimization, recycling, and environmental auditing programs. The public has quickly awakened to the problems of hazardous waste and demanded that hazardous wastes will be managed only one way in this country--properly. Together, with EPA's programs, these efforts have provided a deterrent effect that is not measurable--but very noticeable.

PRIORITIES FOR THE HAZARDOUS WASTE PROGRAM

EPA's priorities for the hazardous waste program consist of four distinct areas of activity. These are:

- Implement existing regulations to get facilities cleaned up to continue operation or to close. There are currently about 4,100 operating treatment, storage, and disposal facilities subject to RCRA regulations. Besides this, there are well over 1000 closed facilities subject to RCRA. Each facility has different problems and is in a different state of operation. EPA will therefore focus its corrective action, permitting and enforcement resources on the highest-risk facilities through an integrated facility management planning concept.

- Fill gaps in environmental protection by implementing HSWA. Priorities include banning waste from land disposal; controlling the burning and blending of hazardous waste from industrial and non-industrial boilers; regulating air emissions from all treatment, storage, and disposal facilities; expanding the definition of "characteristic waste" to bring additional amounts of organic waste into the regulatory system; tightening hazardous waste tank regulations; and revising municipal (Subtitle D) regulations.

- Provide remedies for ineffective current rules by fostering a more streamlined and efficient permitting program, amending Subpart F ground-water regulations, strengthening clean closure regulations, and allowing greater flexibility for permit modifications.

- Lay the foundations for a simpler regulatory system by ensuring consistency among different disposal methods to ensure that wastes do not all move to the least regulated part of the system, regulating wastes and products consistently, re-examining and simplifying our definition of hazardous waste, encouraging waste minimization, and identifying and fostering incentive-based private sector approaches to hazardous waste management.

SUMMARY OF THE CHALLENGES OF IMPLEMENTING HSWA

The passage of HSWA in 1984 broadly expanded EPA's hazardous waste management responsibilities by expanding the scope of regulated activities, adding restrictions on land-disposal techniques, closing gaps in the regulations, mandating an accelerated permit schedule, and adding enforcement authority. While this expanded program will promote the national policy objective of reducing hazardous waste generation where feasible and minimizing the present and future threat to human health and the environment, its implementation will challenge EPA's ability to manage an already technically complex and unusually comprehensive program. To meet this challenge, EPA has developed a number of major initiatives, has identified potential problems, and has begun to implement a variety of new programs to deploy its resources as efficiently as possible. The central theme that guides EPA's resource allocation is the maximization of environmental results.

The challenges that confront EPA include: implementing an integrated technology/risk-based decision-making approach that enables the Agency to set priorities and develop more effective regulations; the need to streamline our permitting program to provide guidance and explanation for a technically complex program; the challenge of managing an enormous number of facilities as part of the cradle-to-grave approach of RCRA; the demand of training and retaining a technically proficient work force; and the complexity of developing a responsive and efficient data management system to monitor our progress and identify emerging problems. Other problems include: the difficulty of developing regulations at the cutting edge of technology; the need to reconcile multiple lines of environmental defense; the necessity of accounting for potential cross-media impacts; the possibility of disposal capacity shortfalls; limited insurance availability; and special administrative and coordination requirements across offices (e.g., to reconcile RCRA and CERCLA and to regulate federal facilities).

In each of these areas, EPA has already instituted programs that will help to resolve the problems. These efforts include new management procedures (e.g., the Facility Management Planning process and joint regulatory development and implementation strategy workgroups consisting of Headquarters, Regional and State personnel), work groups to improve coordination, training and public outreach programs, the issuance of detailed guidance, and development of a new data management system (RCRIS).

The Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA) set forth the legislative authority to further the national policy of (a) reducing or eliminating the generation of hazardous waste as expeditiously as possible, wherever feasible, and (b) treating, storing, or disposing of waste in a way that minimizes the present and future threat it may pose to human health. These Acts identify a number of specific programs and activities that must be conducted to achieve their objectives and designate the U.S. Environmental Protection Agency (EPA) as the organization at the federal level with the responsibility and authority to carry out their mandates.

This document reports to Congress on the hazardous waste regulatory activities carried out by EPA under RCRA from fiscal years 1980 to 1985. This period is extremely important in terms of hazardous waste regulatory activities. Although the Solid Waste Disposal Act dates back to 1965, it was not until the RCRA amendments of 1976 that the control of hazardous waste became a major focus of national legislation. Even then, during the years that immediately followed, the work focused on defining the structure of the hazardous waste program and preparing the regulatory standards and procedures that would ultimately be applied.

From 1980 to 1985, the regulatory framework for the program was promulgated and the various activities under the program reached a state of maturity and full implementation. This report addresses these accomplishments and discusses the future direction of the hazardous and solid waste program. Chapter 2 provides a perspective on the history of solid and hazardous waste legislation and explains RCRA's objectives. Chapter 3 describes the various activities that are part of the RCRA and HSWA implementation effort and describes the major accomplishments of each activity during the five years. Chapter 4 provides a discussion of future priorities of the hazardous and solid waste program, with an emphasis on the activities required by HSWA. Finally, Chapter 5 discusses a number of issues that will affect EPA's ability to carry out the program and describes current EPA activities for meeting these challenges.

HISTORY OF HAZARDOUS WASTE LEGISLATION

CHAPTER 2

Despite the federal government's 20-year history of involvement with solid waste management, it has only recently been actively involved. As awareness of the extent of the hazardous waste problem has grown, EPA's efforts to address the problem have become increasingly comprehensive, having to respond to an expanding universe of facilities and complex technical issues.

SOLID WASTE DISPOSAL ACT OF 1965

As the population of the United States has grown and become increasingly concentrated in urban areas, and as the standard of living has improved, the amount of solid waste generated by the nation has grown dramatically. The growth in tonnage of solid waste -- including consumer packaging materials, scrap, garbage, urban refuse, and other conventional wastes -- has increasingly posed a threat to the air, water, and land resources of the nation, as well as to public health.

In response to these solid waste problems, Congress passed the Solid Waste Disposal Act (SWDA) in 1965 with two primary purposes in mind: (1) to initiate a national research and demonstration program for new and improved methods of solid waste disposal, and (2) to provide financial and technical expertise to state and local governments for the planning and operating of solid waste disposal programs.

Initially administered by the Department of Health, Education and Welfare and the Department of the Interior, the SWDA primarily focused on the management of open dumps. There were two major components of the early solid waste program. The first involved grants to public and private agencies for research and demonstration (including construction) of improved solid waste disposal technologies. This included job-training projects to prepare people for professions operating and maintaining solid-waste-disposal facilities. The second major component of the program involved grants to state and regional agencies for conducting solid-waste surveys and developing state, local, and regional solid-waste-disposal plans.

RESOURCE RECOVERY ACT OF 1970

In 1970, Congress amended the SWDA with the Resource Recovery Act (RRA). This new act expanded upon the SWDA in three significant ways, while continuing its focus on solid waste. First, it enlarged existing programs under the SWDA, including grants for training solid-waste-management professionals, technical and financial assistance for state and local planning, and grants for research and development. Second, the RRA promoted development of sanitary landfills as an alternative to open dumps by providing for promulgation of increasingly strict solid-waste-management guidelines and by providing grants for the construction of new or improved disposal facilities. And third, the RRA extended the focus of federal efforts beyond waste disposal to include conservation, recycling, and resource recovery. This was accomplished in part by authorizing grants for the construction and demonstration of resource-recovery systems, and by expanding the research and demonstration programs. The law also provided for the establishment of a cabinet-level interagency resource conservation committee to assist in developing a national policy on solid waste management.

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

While both the SWDA and RRA focused exclusively on the problem of solid waste management, the passage of the Resource Conservation and Recovery Act of 1976 (RCRA) marked a new recognition of the threat to public health and the environment posed by poor management of chemical wastes. Although technically adopted as an amendment to SWDA, RCRA entirely revised and superseded previous solid waste legislation through its new focus on hazardous waste.

Under RCRA, the Office of Solid Waste was established within EPA to implement a comprehensive "cradle to grave" system for managing hazardous chemical wastes. Subtitle C of RCRA, which contained most of the major provisions, required EPA to establish criteria for identifying hazardous wastes and to publish a listing of hazardous wastes falling under the new law. The cradle-to-grave system required EPA to set performance standards for generators and transporters of hazardous waste as well as for owners and operators of hazardous waste storage, treatment, and disposal facilities. Moreover, EPA was required to develop -- and generators, transporters, owners, and operators were required to comply with -- record-keeping, labeling, and manifest systems intended to track operations involving hazardous wastes and ensure compliance. Procedures for permitting facilities for storing, treating, and disposing of hazardous wastes were also to be developed and implemented. Finally, RCRA empowered EPA to undertake enforcement activities and on-site inspections, and to assess criminal and civil penalties against violators in order to encourage future compliance.

RCRA also emphasized that a viable federal-state partnership was to be established, and that the hazardous waste program should be administered by states so long as their programs were equivalent to and consistent with the federal program, and they had the necessary resources to implement them. RCRA provided financial assistance to states to facilitate their development of hazardous waste programs.

SOLID WASTE DISPOSAL ACT AMENDMENTS OF 1980

In 1980, Congress passed a set of amendments to RCRA that included conducting detailed and comprehensive studies associated with mining wastes generated from the combustion of coal and other fossil fuels (Section 8002); developing Section 3004 regulations that distinguish, where appropriate, between requirements for new and existing hazardous waste management facilities; regulating recycled oil; determining whether used oil should be listed as a hazardous waste; establishing a state hazardous waste facility inventory; and giving EPA the authority to order facilities to conduct ground-water monitoring, testing, and analysis when the Administrator determines the presence of a release may pose a substantial hazard. These amendments also introduced a provision enabling the EPA to bring legal actions against persons whose handling of hazardous waste presented a known danger to the well-being of others.

HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

In contrast to the 1980 amendments, the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA represent a substantial evolutionary step in federal involvement with hazardous waste management, both in terms of its requirements for the hazardous waste industry and in its implementational requirements for EPA. In all, the 1984 amendments consist of 72 statutory requirements, 69 of which must be completed by the end of fiscal year 1988.

Expansion of the EPA's hazardous waste responsibilities took place primarily in five areas. First, the new amendments restricted land disposal of untreated hazardous wastes. Second, it imposed more stringent regulations for wastes that were still eligible for land disposal in order to ensure protection of ground-water and air. Third, HSWA required corrective action for prior releases of pollutants at hazardous waste (Subtitle C) facilities. Fourth, it closed loopholes in the program by bringing new types of facilities and additional categories of hazardous waste under regulation. After HSWA, underground storage tanks, small-quantity generators (producing between 100 and 1,000 kilograms of hazardous waste per month), burners and blenders of hazardous waste fuels, and Subtitle D landfills accepting hazardous wastes would be regulated. These provisions greatly increased the number of firms subject to regulation under RCRA and HSWA. And fifth, the goal of increased waste minimization was elevated to the status of a national policy and provisions were created to further the attainment of that policy.

Subtitle C of RCRA requires EPA to undertake specific activities. EPA's Office of Solid Waste and Office of Waste Programs Enforcement carry out those activities through four programs:

- the regulatory development program, charged with developing the comprehensive and complex regulations required by RCRA;
- the state authorization program, which helps states develop hazardous waste regulations and implementation programs sufficient to warrant federal authorization and create a viable federal-state partnership;
- the permitting program, responsible for calling in, reviewing, and rendering final judgment regarding issuing permits and closing facilities; and
- the enforcement program, which monitors compliance and takes enforcement actions to ensure that facilities are meeting permit regulations and other regulatory requirements.

Following are the evolution of these programs and their major accomplishments through the end of fiscal year 1985.

HAZARDOUS AND SOLID WASTE REGULATORY PROGRAM

Overview and History

RCRA contained Subtitle C provisions to establish standards to ensure the proper management, transportation, treatment, storage, and disposal of hazardous waste. RCRA required EPA to develop criteria for determining what is a hazardous waste; to identify hazardous wastes according to such criteria; to develop standards for all handlers of hazardous waste from the point a hazardous waste is created to its final disposition; to develop procedural and technical requirements for the permitting of treatment, storage, and disposal facilities (TSDFs); and to develop requirements and procedures for authorizing states to administer the requirements of Subtitle C.

Developing RCRA was unusually difficult for several reasons. First, unlike most other regulatory programs which apply to pollutants only after they have left a facility (so-called end-of-pipe regulations, as for air emissions and water discharges), the hazardous waste regulations cover the entire life cycle of hazardous waste, from "cradle to grave." At the same time, hazardous wastes vary widely from facility to facility, and their interaction with the environment can sometimes be difficult to determine, given the present state of technical knowledge. Thus, the regulation of hazardous waste is unusually complex and comprehensive. Several years were required simply to understand and assess the universe of hazardous waste that would require regulation.

Second, an unusually large number of facilities -- each with features that uniquely affect the environmental and health risk presented -- were to become subject to EPA's regulations. Nevertheless, RCRA contemplated the issuance of detailed, design and performance-based minimum technical standards that would apply to all facilities. Not surprisingly, the job of balancing the many different factors present at individual TSDFs, the need to promulgate understandable, enforceable regulations, and the need to protect human health and the environment from undue risk proved to be a difficult, time-consuming task that involved unprecedented information collection, public interaction, guidance, and revision during the course of putting the regulatory structure into place.

Finally, the RCRA program was initiated with little precedent and very little experience. Very few states had any substantial hazardous waste programs in place in 1980, and the requirements for RCRA implementation, which Congress intended to be delegated to the states, required implementation of new programs and substantial technical training.

Development of the Phase I Regulations

From 1980 to 1983, EPA promulgated the regulations that became the core of the hazardous waste regulatory program. These regulations were promulgated in two phases. The first phase included the following regulations, which were proposed in 1978 and 1979, and promulgated during 1980:

- Identification and Listing of Hazardous Waste (responds to Section 3001, now found in 40 CFR Part 261) -- promulgated May 19, 1980;
- Standards for Generation of Hazardous Waste (responds to RCRA Section 3002, now found in 40 CFR Part 262) -- promulgated February 26, 1980;
- Standards for Transporters of Hazardous Waste (responds to RCRA Section 3003, now found in 40 CFR Part 263) -- promulgated February 26, 1980;
- Interim Status Standards (responds to RCRA Section 3004, now found in 40 CFR Part 265) -- promulgated May 19, 1980;
- Consolidated Permit Regulations (responds to RCRA Section 3005, now found in 40 CFR Part 270) -- promulgated May 19, 1980; and

- State Program Requirements (responds to RCRA Section 3006, now found in 40 CFR Part 271) -- promulgated May 19, 1980.

Identification and Listing of Hazardous Waste

Under 40 CFR Part 261, these standards identified four characteristics of a waste that render it hazardous -- ignitability, corrosivity, reactivity, and extraction process (EP) toxicity. In addition, they identified wastes that were acutely hazardous or toxic. Finally, they identified and listed hazardous wastes according to whether they were generated from non-specific sources (40 CFR 261.31), specific sources (40 CFR 261.32), or discarded products, off-specification wastes, container residues, or spill residues (40 CFR 261.33). This included 16 non-specific source wastes, such as spent halogenated solvents; 69 wastes from specific sources such as waste-water-treatment sludges from various production processes; and 361 wastes from discarded products, spill residues (§261.33(e) and (f)).

Standards for Hazardous Waste Generators

Under 40 CFR Part 262, EPA required solid waste generators first to determine if their waste is hazardous (i.e., if it is listed or, by knowledge or testing, if it exhibits hazardous characteristics). If so, they were required (1) to obtain an EPA identification number, (2) to prepare a manifest for transporting wastes to an off-site TSDF, (3) to package and label the waste as "Hazardous Waste," (4) to accumulate waste on-site for no more than 90 days without a storage permit, (5) to maintain records of signed waste manifests, and (6) to issue annual reports and exception reports to EPA describing waste generation.

Standards for Hazardous Waste Transporters

Under 40 CFR Part 263, EPA also required transporters of hazardous waste to obtain an EPA identification number, to comply with manifesting and record-keeping requirements, and to initiate immediate action, notification, and cleanup of any hazardous waste discharge during transportation. Transporters also become generators of hazardous waste if they mix hazardous waste of different DOT shipping classes.

Interim Status Standards*

Under 40 CFR Part 265, EPA issued interim final technical requirements for TSDFs during the interim-status period (after

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* Under section 3005 of the 1984 Hazardous Waste and Solid Waste Amendments to RCRA interim status is granted to any person who owns or operates a facility required to have a permit that was in existence on November 19, 1980 or is in existence on the effective date of statutory or regulatory changes under RCRA that require the facility to have a permit if such person complies with notification requirements under section 3010 of RCRA and applies for a permit in accordance with section 3005.

Part A** submission and before final determination). These requirements governed preparedness and prevention of hazards, contingency planning and emergency procedures, the manifest system, record keeping and reporting, ground-water monitoring, facility closure and postclosure care, the use and management of containers, and the design of tanks; surface impoundments; waste piles; land-treatment facilities; landfills; incinerators; thermal, physical, chemical, and biological treatment units; and injection wells. In addition, EPA issued interim final standards for issuing permits under 40 CFR Part 264 with respect to general requirements (e.g., obtaining an EPA identification number, emergency procedures).

Standards for Permit Issuance and for Authorization of State Programs

Under 40 CFR Part 123, EPA established requirements for state programs under RCRA and the Underground Injection Control (UIC) program (Safe Drinking Water Act). Under Part 122, it established several permit requirements (e.g., permit contents and revisions), and under Part 124, it put administrative procedures for permit decisions, including

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** Subsection 270.13 describes a Part A permit submission to include, among other things, activities conducted by the applicant; name and location of the facility; name and address of the owner and operator; an indication of whether the facility is new or existing; a scale drawing of the facility; a description of the processes to be used; and a listing of all wastes to handled.

public participation, consolidated review, multiple permits, and permit appeals. These parts were later revised and placed under 40 CFR Parts 270 and 271.

Development of the Phase II Regulations

From 1981 to 1983, EPA promulgated Phase II standards which created the technical and financial responsibility requirements for storage and treatment facilities (Phase IIA), incinerators (Phase IIB), and land disposal facilities (Phase IIC) to obtain final operating permits. The following regulations represented Phase II of the regulatory effort:

- Financial Responsibility Requirements (responds to RCRA Section 3004, now found 40 CFR Part 264) -- promulgated January 12, 1981;
- Technical Standards for Storage and Treatment Facilities (responds to RCRA Section 3004, now found in 40 CFR Part 264) -- promulgated January 12, 1981;
- Technical Standards for Incinerators (responds to RCRA Section 3004, now found in 40 CFR Part 264) -- promulgated January 23, 1981;

- Interim Regulations for New Land Disposal Facilities (responds to RCRA Section 3004, now found in 40 CFR Part 267) -- promulgated February 13, 1981; and
- Technical Standards for Existing Land Disposal Facilities (responds to RCRA Section 3004, now found in 40 CFR Part 264) -- promulgated July 26, 1982.

Financial Responsibility Requirements

Under these standards, owners and operators of TSDFs were required to estimate the costs of closure and postclosure care, ensure financial responsibility for those costs through several types of mechanisms, and maintain insurance for environmental liabilities arising from facility operations.

Standards for Storage and Treatment Facilities

These were the final design and operating requirements TSDFs had to meet to obtain final permits. They governed location, closure and postclosure care, financial requirements, use and management of containers, and the storage and the treatment of hazardous waste in tanks, new surface impoundment facilities, and waste piles. These regulations became effective on July 13, 1981.

Standard for Incinerators

In addition to creating a number of standards relating to operation and closure, these permitting regulations required incinerators to achieve a 99.99 percent destruction and removal efficiency for all principal organic hazardous constituents.

Interim Standards for New Land-Disposal Facilities

Recognizing the need to be able to permit new facilities while final regulations were being developed, EPA issued these standards. They were intended to be effective only until EPA developed final standards for land-disposal facilities and allowed EPA to specify control requirements and other permit conditions on a case-by-case basis.

Standards for Land-Disposal Facilities

These standards consisted of technical requirements for owners and operators of new and existing hazardous waste land-disposal facilities, and corresponding procedures for permit applications. Effective on January 26, 1983, they applied to landfills, surface impoundments, waste piles, and all land treatment units used to treat, store, or dispose of hazardous wastes. They were composed primarily of two types of performance standards: (1) design and operating standards, including required installation of liners and leachate collection systems at landfills, and (2) ground-water monitoring and response (corrective action) at each of the four types of units.

Regulatory Activity after Development of the Core Program and before HSWA

From mid-1982 to the end of 1984 (when Congress enacted the Hazardous and Solid Waste Amendments (HSWA) to the Solid Waste Disposal Act), EPA issued numerous technical amendments and further clarification and minor amendments to its Phase I and Phase II regulations, and concentrated on the implementation of these regulations through issuance of guidance documents, technical training programs, and the authorization of state hazardous waste programs. On January 4, 1985, EPA finalized its clarification of which materials are solid and hazardous wastes when they are recycled, and issued standards for various types of recycling activities. These rules were proposed on April 4, 1983, in response to the Solid Waste Disposal Amendments of 1980 (Public Law 96-452, October 21, 1980), and became effective on July 5, 1985, with certain exceptions.

Essentially, these regulations subjected four types of recycling activities to Subtitle C jurisdiction: uses constituting disposal (e.g., placement of wastes onto the land), burning waste for energy recovery, reclamation, and speculative accumulation. Furthermore, all spent materials, sludges, commercial chemical products, and by-products are defined as solid wastes when recycled, except for reclaimed or accumulated commercial chemical products and nonlisted/noncharacteristic sludges and by-products. In addition, secondary materials that are used as ingredients or feedstocks in a production process are not solid wastes. (To be hazardous a "waste" must first be defined as solid waste.) Reclaimed industrial ethyl alcohol and recycled lead-acid batteries were excepted from regulation, and, in general, uses constituting disposal and burning are regulated as hazardous waste activities under Parts 262 through 265.

Regulatory Development in Response to HSWA

The Hazardous and Solid Waste Amendments of 1984 have set a number of priorities requiring a regulatory response. In response to HSWA, EPA is actively working on regulations concerning various technical standards and locational requirements for land-disposal units. EPA is also revising standards regarding the listing and delisting of hazardous wastes and the handling of recycled material, and is considering whether to bring a number of currently excluded wastes under the Subtitle C regulations. Finally, EPA is evaluating the regulations for a number of waste-handling facilities -- such as boilers burning hazardous waste, municipal solid waste incinerators, and municipal landfills -- to determine whether additional regulations are required. A more extensive discussion of major HSWA requirements is found in Chapter 4.

A number of regulatory provisions have already been promulgated in response to HSWA. On January 14, 1985, EPA listed dioxin-containing waste under 40 CFR Part 261 and subjected it to more stringent management standards (including a 99.9999 percent destruction and removal efficiency for incineration). On June 26, 1985, EPA proposed standards for secondary containment and/or ground-water monitoring for underground hazardous waste tanks. Both provisions increased the universe of regulated facilities. On July 15, 1985, EPA codified 25 of the statutory provisions of HSWA, including a ban on bulk liquids in landfills; redefinition of "regulated unit" for purposes of ground-water monitoring and response; corrective action requirements for solid-waste-management units; new labeling and record-keeping requirements; creating the loss of interim status for facilities failing to submit Part B applications or failing to certify compliance with ground-water monitoring and financial responsibility requirements by November 8, 1985; and requiring certification by generators and owners or operators of TSDFs that they have instituted a waste-minimization program. In recent months, EPA has also issued proposals for a land disposal restrictions program for dioxins and solvents, and waste-as-fuel administrative standards; the final rules for hazardous waste tanks, and for small quantity generators; and the final rule to streamline EPA approval of State program revisions. (See Appendix A for a detailed list of recent outputs.)

Major future regulatory efforts to carry out the requirements of HSWA include addressing the restriction of other untreated wastes in land disposal facilities, the listing and regulation of additional hazardous wastes, promulgating regulations for underground storage tanks, municipal landfill (Subtitle D) facilities, blenders and burners of hazardous waste, and waste minimization.

STATE AUTHORIZATION PROGRAM

The RCRA amendments to the Solid Waste Disposal Act place a major emphasis on the partnership between the federal government and the states in implementing the Subtitle C regulations. Specifically, Section 1003 of the Act states that a major objective of the Act is

> ... establishing a viable Federal-State partnership to carry out the purposes of this Act and insuring that the Administrator will, in carrying out the provisions of Subtitle C of this Act, give a high priority to assisting and cooperating with the States in obtaining full authorization of State programs under Subtitle C.

Consequently, to the extent possible, it has been EPA's objective to have states conduct as much of the hazardous waste regulations program as possible. These responsibilities including defining which wastes are hazardous, conducting the manifest program for generators and transporters, permitting treatment, storage and disposal facilities, and enforcing compliance with the regulations.

Section 3006 of the 1976 RCRA specifically required EPA to promulgate guidelines to help states develop hazardous waste programs. Two types of authorization were described in the Act: interim and final authorization. To receive final authorization, a state program must be equivalent to and consistent with the federal program and provide for adequate enforcement. State programs, however, are not restricted to the federal regulations and, as stated in the Act, are allowed to be more stringent and broader in coverage. The status of interim authorization was set forth in the Act largely in recognition of the fact that very few state programs existed at a level that would allow full equivalence with the federal program in a short period of time. Consequently, interim authorization allowed a state to become involved in the regulatory process at an earlier point and provided a period during which it could move toward full equivalency. A state could be granted interim authorization when its hazardous waste regulatory program was "substantially equivalent" to the federal program. Under either interim or final authorization for any part of the federal program, the state laws, rather than federal laws, are applied.

Due to the phasing of the promulgations of the core RCRA program, interim authorizations also proceeded in two phases. Under Phase I interim authorization, states administered the portion of the program concerning the identification and listing of waste; the application of standards to generators and transporters of hazardous waste; and the application of the interim-status standards to hazardous waste treatment, storage, or disposal facilities. Allowing states to administer the permit program, the Phase II program was divided into three components: Phase IIA -- storage and treatment facilities; Phase IIB -- incinerators; and Phase IIC -- land-disposal facilities. States with Phase I authorization could be granted authorization for any combination of components in any sequence. States also had the option of moving directly to final authorization.

EPA Efforts in the Implementation of the Program

A major EPA activity at the initiation of the state authorization program that has continued throughout its existence is providing federal funds to states. Because very few states had hazardous waste programs in place in the early 1980's that approached the federal program in terms of breadth and stringency, these funds were essential in allowing states to obtain qualified personnel who could help them put the necessary enabling legislation in place and effectively administer the resulting regulations. As state programs evolved, these funds plus matching funds from authorized states helped expand and improve the experience of state personnel involved in program implementation and enforcement. From $14.5 million and $18.1 million in fiscal years 1979 and 1980, the total amount of State grants to implement the Subtitle C program has grown steadily to an estimated level of $57.0 million in fiscal year 1985. These amounts indicate the substantial expansion of efforts to regulate hazardous waste that has taken place at the state level.

Another major activity undertaken at the federal level to assist in the success of the federal-state partnership was the provision of Program Implementation Guidance. Because an authorized state was implementing state rather than federal regulations, issues of consistency and substantial equivalence rapidly became important in addition to the need to clarify certain regulatory provisions. Consequently, shortly after the initiation of the Phase I program, EPA began to send out memoranda under a Program Implementation Guidance System to provide interpretation of regulatory provisions and clarify important issues. Under this program, EPA has sent out numerous memoranda dealing with issues regarding listing, delisting, permitting, and federal-state equivalency and consistency.

The federal government has also been responsible for the oversight of state programs throughout the authorization program. Because of the requirements set forth in RCRA, EPA must constantly monitor the activities of states with hazardous waste programs to ensure that these programs are maintaining substantial (interim authorization) or full equivalency with the federal program, are consistent with the federal program, and are provided adequate resources for implementation and enforcement. This oversight function has assisted states in a number of important areas, including the identification and resolution of unconstitutional or inadequate state statutes, the identification of insufficient personnel and/or funding to conduct programs effectively, the identification and resolution of inadequacies in enforcement and permitting procedures, and the identification and correction of problems in the collection and management of essential program data.

Program Results

The process of granting authorization to the states began in 1980 as EPA promulgated the Phase I regulations. In that year, six states were granted interim authorization for the Phase I program. An additional 21 were granted interim authorization in 1981, bringing the total to 27. As shown in Table 3-1, 45 of the 54 states* ultimately received interim

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* For purposes of the state authorization program, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands are considered as states.

Table 3-1

ANNUAL NUMBERS OF STATES GRANTED AUTHORIZATION FOR SUBTITLE C PROGRAMS[1]

	1980	1981	1982	1983	1984	1985	Jan. 31, 1986	Total
Phase I	6	21	8*	9**	1	—	—	45
Phase II								
A	—	—	7	12+	6	—	—	25
B	—	—	7	10+	6	—	—	23
C	—	—	—	7	8	—	—	15
Final Authorization	—	—	—	—	11	20	8	39

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* Includes Puerto Rico.

** Includes Guam and District of Columbia.

+ Includes District of Columbia.

[1] As of January 31, 1986, interim authorization expired. Seven state programs that had not obtained final authorization reverted to EPA. As of May 31, 1986, an additional two states have obtained final authorization (West Virginia and New York).

SOURCE: U.S. Environmental Protection Agency.

authorization for the Phase I program. Additional details regarding dates of authorization by state is provided in Table 3-2.

In 1981, regulations came into effect concerning storage facilities (Phase IIA) and incinerators (Phase IIB). Regulations for land disposal facilities (Phase IIC) were promulgated in early 1982. In 1982, states began to receive interim authorization for components A and B of the Phase II program. In 1983, states started receiving interim authority to implement the Phase IIC program. By the end of 1984, 15 states had achieved interim authorization for the entire Phase II program, an additional eight states had received authorization for components A and B, and two states had received authorization for component A only.

In 1984, states began receiving final authorization for the pre-HSWA program. Eleven states received authorization in 1984. An additional 20 states received authorization in 1985, and eight more states had received final authorization by the end of January 1986, at which time all interim authorization expired. Of the remaining 15 states, tentative decisions had been made to authorize two additional states, and seven other states had submitted applications for final authorization. Consequently, by the end of January 1986, only six states were not in the final authorization process. Of these six, only three -- the Virgin Islands, Wyoming,

TABLE 3-2
AUTHORIZATION FOR THE PRE-HSWA PROGRAM BY STATE**

	STATES WITH INTERIM AUTHORIZATION				STATES WITH FINAL AUTHORIZATION		
		PHASE II					
STATE	PHASE I	A	B	C	Submitted	Tenative	Granted
Alabama	25-Feb-81	---	---	---	Nov-85	---	---
Alaska	---	---	---	---	---	---	---
Arizona	18-Aug-82	---	---	---	Nov-84	20-Mar-85	04-Dec-85
Arkansas	19-Nov-80	19-Apr-82	19-Apr-82	24-Jan-84	Jul-84	12-Oct-84	25-Jan-85
California	04-Jun-81	11-Jan-83	---	---	Nov-85	22-Apr-86	---
Colorado	---	---	---	---	Feb-84	06-Aug-84	02-Nov-84
Connecticut	21-Apr-82	29-Jun-83	29-Jun-83	29-Jun-83	Aug-85	---	---
Delaware	25-Feb-81	---	---	---	Aug-83	14-Oct-83	22-Jun-84
District of Columbia	22-Nov-83	22-Nov-83	22-Nov-83	---	Aug-84	26-Nov-84	22-Mar-85
Florida	19-May-82	29-Dec-83	29-Dec-83	24-Feb-84	Jul-84	16-Nov-84	12-Feb-85
Georgia	03-Feb-81	21-May-82	21-May-82	04-Nov-83	Feb-84	07-May-84	21-Aug-84
Guam	16-May-83	---	---	---	Aug-85	14-Nov-85	27-Jan-86
Hawaii	---	---	---	---	---	---	---
Idaho	---	---	---	---	---	---	---
Illinois	17-May-82	---	---	---	Jul-85	19-Nov-85	31-Jan-86
Indiana	18-Aug-82	---	---	---	Aug-85	19-Nov-85	31-Jan-86
Iowa	30-Jan-81	---	---	---	---	---	---
Kansas	21-Sep-81	---	---	---	Jul-84	31-Jul-85	17-Oct-85
Kentucky	01-Apr-81	28-Jan-83	28-Jan-83	29-Feb-84	Jul-84	24-Oct-84	31-Jan-85
Louisiana	19-Dec-80	24-Jan-84	24-Jan-84	24-Jan-84	Aug-84	07-Nov-84	07-Feb-85
Maine	18-Mar-81	26-Sep-83	26-Sep-83	26-Sep-83	Feb-85	---	---
Maryland	08-Jul-81	23-Nov-83	09-Jul-84	09-Jul-84	Jul-84	26-Oct-84	11-Feb-85
Massachusetts	25-Feb-81	03-Aug-84	03-Aug-84	03-Aug-84	Jul-84	17-Oct-84	07-Feb-85
Michigan	---	---	---	---	Nov-85	04-Feb-86	---
Minnesota	---	---	---	---	Jul-84	21-Nov-84	11-Feb-85
Mississippi	07-Jan-81	31-Aug-82	31-Aug-82	26-Apr-83	Sep-82	19-Mar-84	27-Jun-84
Missouri	08-Nov-83	---	---	---	Jul-85	25-Sep-85	04-Dec-85
Montana	17-Feb-81	---	---	---	Jan-84	06-Apr-84	25-Jul-84
Nebraska	14-May-82	---	---	---	Jun-84	06-Nov-84	07-Feb-85
Nevada	19-Jul-83	19-Jul-83	19-Jul-83	---	May-85	19-Aug-85	01-Nov-85

**As of June 30, 1986

TABLE 3-2
AUTHORIZATION FOR THE PRE-HSWA PROGRAM BY STATE** (cont'd)

	STATES WITH INTERIM AUTHORIZATION				STATES WITH FINAL AUTHORIZATION		
		PHASE II					
STATE	PHASE I	A	B	C	Submitted	Tenative	Granted
New Hampshire	03-Nov-81	31-Mar-83	31-Mar-83	---	Jun-84	01-Oct-84	03-Jan-85
New Jersey	02-Feb-83	06-Apr-84	06-Apr-84	---	Jul-84	28-Nov-84	21-Feb-85
New Mexico	30-Sep-83	30-Sep-83	30-Sep-83	---	Jul-84	24-Oct-84	25-Jan-85
New York	27-Dec-83	---	---	---	Nov-85	07-Jan-86	29-May-86
North Carolina	18-Dec-80	26-Mar-82	26-Mar-82	07-Feb-84	Jul-84	28-Sep-84	31-Dec-84
North Dakota	12-Dec-80	---	---	---	Mar-84	10-Jul-84	19-Oct-84
Ohio	15-Jul-83	---	---	---	Jul-85	---	---
Oklahoma	14-Jan-81	13-Dec-82	13-Dec-82	24-Jun-83	Jun-84	24-Sep-84	10-Jan-85
Oregon	16-Jul-81	---	---	---	Jun-84	06-Dec-85	31-Jan-86
Pennsylvania	26-May-81	---	---	---	Oct-85	12-Nov-85	30-Jan-86
Puerto Rico	14-Oct-82	---	---	---	Nov-85	---	---
Rhode Island	29-May-81	29-May-84	---	---	Aug-84	03-Dec-85	31-Jan-86
South Carolina	25-Feb-81	03-Nov-82	03-Nov-82	06-Dec-83	Jul-84	13-Sep-85	22-Nov-85
South Dakota	---	---	---	---	Mar-84	10-Jul-84	02-Nov-84
Tennessee	16-Jul-81	---	---	---	Jul-84	02-Nov-84	05-Feb-85
Texas	24-Dec-80	23-Mar-82	23-Mar-82	01-Sep-83	Jun-84	09-Oct-84	26-Dec-84
Utah	12-Dec-80	---	---	---	Feb-84	05-Jul-84	24-Oct-84
Vermont	15-Jan-81	24-Jan-84	24-Jan-84	24-Jan-84	Jul-84	04-Oct-84	21-Jan-85
Virgin Islands	---	---	---	---	---	---	---
Virginia	03-Nov-82	17-Aug-83	17-Aug-83	---	Jul-84	13-Sept-84	18-Dec-84
Washington	02-Aug-83	02-Aug-83	02-Aug-83	---	Jul-84	06-Dec-85	31-Jan-86
West Virginia	28-Mar-84	28-Mar-84	28-Mar-84	---	Jun-85	13-Jan-86	29-May-86
Wisconsin	15-Jan-82	---	---	---	Jul-85	27-Nov-85	31-Jan-86
Wyoming	---	---	---	---	---	---	---

SOURCE: U.S. Environmental Protection Agency.

and Hawaii -- had expressed an intent not to adopt the RCRA program. Of these three, there were indications that Hawaii and Wyoming were moving to develop state programs.

The process of interim and final authorization not only has served to put in place a viable federal-state partnership for conducting the regulatory program but has also resulted in a remarkable improvement in the caliber of state programs in a relatively brief period of time. When the RCRA regulations (Phase I and Phase II) were promulgated, a number of states had some form of hazardous waste regulatory program in place, but only a few approached to any degree the breadth and stringency of the federal standards. The funding and guidance provided by EPA as part of the authorization effort has caused states to place a high priority on the regulation of hazardous wastes. As a result, states have put in place the enabling legislation and adequate technical and enforcement personnel to conduct a comprehensive and effective regulatory effort.

A review of state programs before and after the authorization process highlights some of these improvements. Nine states developed a hazardous waste program where none had previously existed. In other states, hazardous waste programs were broadened through the adoption of RCRA standards and strengthened through the expansion of criminal and civil enforcement authorities. In a number of states, the increasing awareness of the problems associated with hazardous waste disposal has caused the promulgation of standards that go beyond the requirements of the Phase I and II regulations, taking such steps as imposing more stringent requirements for small-quantity generators or banning the disposal of liquid wastes in landfills. Finally, an improvement that cannot be measured by tallying numbers or reviewing laws is the increased capabilities of the personnel assigned to RCRA activities. The evaluation of this program has resulted in not only a larger but a more experienced and technically sophisticated staff to implement the comprehensive and complex set of regulations.

The Impact of HSWA

The Hazardous and Solid Waste Amendments of 1984 had several major impacts on the state authorization process. One of these was to set a deadline for the termination of interim authorization on January 31, 1986, as specified in Section 3006(c). Another and perhaps more significant impact of HSWA is found in Section 3006(g), which states that any requirement or prohibition that is applicable to the generation, transportation, storage, or disposal of hazardous waste as a result of HSWA will take effect in each state having a finally authorized program on the same date as the requirement takes effect in other states. Previously, federal regulations and statute changes could not be enforced in a state authorized to run the RCRA program in lieu of the federal government until the state adopted such changes. HSWA provides that the Administrator "shall carry out such requirements directly in each state unless the state program is finally authorized ... with respect to such requirement."

As a result of the first provision, Phase II interim status for four states and Phase I status for six states expired, with the responsibility for program implementation reverting to EPA at least temporarily. In all of these cases (seven states are involved in total), EPA had received applications for final status, and in two cases EPA had issued tentative approval for final authorization by January 31, 1986. Consequently, EPA must give high priority to close coordination with these states in the period between January 31, 1986, and final authorization to avoid major disruptions of the regulatory programs in those states. This should not present major problems.

The second provision has more far-reaching consequences. The HSWA amendments themselves place into immediate effect a number of statutory requirements that differ from the pre-HSWA regulations. The requirement that these provisions go into effect simultaneously in authorized and unauthorized states means that as the federal program changes, programs in authorized states will no longer be equivalent to the federal program. As a result, until a state receives authorization for HSWA provisions, it will have to share program implementation responsibilities with EPA. It seems unlikely that this shared responsibility can be avoided for any length of time. HSWA has mandated that as many as 60 federal program changes take place through May of 1990 that will necessitate state program revisions. Thus, a major challenge facing the state authorization program in coming years will be dual activities helping states receive authorization for HSWA provisions as expeditiously and efficiently as possible, while simultaneously providing adequate guidance so that states and the federal government can achieve effective coordination in administering HSWA requirements for which states are not fully authorized. To simplify the incorporation of HSWA requirements into state programs, EPA has already proposed a program whereby HSWA requirements promulgated in various time periods would be clustered and subsequently addressed by state programs _en masse_ (see 51 FR 496-504), rather than on a one-to-one basis with a new annual clock starting at every promulgation.

THE PERMITTING PROGRAM

Description of the Permitting Process

One of the major purposes of the Resource Conservation and Recovery Act is to ensure that hazardous waste management practices are conducted in a manner that protects human health and the environment. To achieve this objective, Section 3005 of Subtitle C requires all facilities involved in treating, storing, or disposing of hazardous waste to be identified and to have a permit for operation. Under Subtitle C, any owner or operator of a TSDF handling wastes identified as hazardous must notify EPA or a state with an approved hazardous waste management program of its location and activities within 90 days of its waste being listed as hazardous. Six months after the initial listing of a waste as hazardous, any facility that has not applied for or received a RCRA permit is no longer permitted to handle the hazardous waste.

Interim-Status Operating Permits

The RCRA permitting process proceeds in several stages. An existing facility (in operation or under construction on November 19, 1980) that notifies EPA or an authorized state that is handling a waste listed as hazardous under Section 3001 and that submitted a Part A application within six months is granted interim status until a final determination is made on the permit application. Under interim status, facilities must comply with 40 CFR Part 265 standards. These standards are largely self-implementing and less stringent than those that must be met by facilities with final permits (under 40 CFR Part 264). Interim status is also available to existing facilities on the effective date of any new statutory or regulatory changes under RCRA requiring them to obtain a

Section 3005 permit, provided that a facility notifies EPA and submits a Part A application by the time of the effective date.

Final Permits

An authorized state or EPA (if the state had not received Phase II interim or final authorization) may require a hazardous waste management facility operating under interim status to submit a Part B application. The state or EPA must provide 180 days notice to the facility as part of this process of "calling in" Part B submissions. Facilities are, of course, allowed to voluntarily submit Part B applications at any time.

For new hazardous-waste-management facilities, the Part A and Part B submissions are combined. These facilities must submit these applications and be issued a permit before physical construction can begin.

Once the Part B permit application has been received, it is evaluated at length by either the authorized state or EPA. After this review, EPA or the authorized state provides the public with an opportunity to comment on the draft permit or notice of intent to deny the permit. After the public comment period, a final determination is made. Once permitted, facilities must comply with the more stringent 40 CFR Part 264 standards.

Closure under Interim Status

An owner or operator of a facility that is operating under interim status must have a written copy of a closure plan for the facility. Owners or operators must submit a copy of this plan to the regional administrator or director of the authorized state at least 180 days before the date that they expect to initiate closure or within 15 days of the date on which interim status expires.

After a period of public comment, the regional administrator approves, modifies, or disapproves the plan within 90 days of its receipt. If the plan is not approved, another 60 days is provided to arrive at a modified final plan. If any hazardous waste remains at the disposal facility, postclosure care must continue after closure for a period of 30 years. This care includes such activities as monitoring ground-water, taking corrective action, and maintaining the integrity of any cover put on the site. The specific responsibilities of postclosure care are generally implemented through a postclosure permit or enforcement order.

Evolution of the Permitting Program

After the passage of RCRA on October 21, 1976, EPA had first to develop regulations for hazardous waste treatment, storage, and disposal facilities (TSDFs). On May 19, 1980, EPA promulgated final Phase I regulations, putting in place the core regulatory program for generators and transporters of hazardous waste, and interim-status provisions for owners or operators of TSDFs. Once these regulations were in place, EPA was able to initiate its state authorization and permitting program.

EPA's initial task was to identify the universe of facilities that would require permit actions. This task proved to be enormous. First of all, the regulations that defined these facilities were extremely complex and comprehensive. Unlike most previous EPA regulatory and permitting efforts, RCRA contemplated cradle-to-grave regulation of hazardous waste disposal. Initially, when the Phase I regulations were still in flux and the identification of hazardous wastes that would require regulation was still undergoing change, EPA estimated that as many as 428,522 facilities (including gasoline service stations) might be handling hazardous waste and that 26,000 might apply for permits. With the May 19, 1980, regulation, generators and owners or operators of TSDFs were required to notify EPA of their hazardous waste activities within 90 days, to obtain an EPA identification number, and (within six months for TSDFs) to submit a Part A application to receive an interim-status permit.

Approximately 14,500 facilities notified EPA of hazardous waste activities and submitted Part A applications. EPA's next task was to verify these notifications and to review Part A submissions (many notifiers had filed with EPA on a "protective" basis, since they were unsure as to whether a submission was required), and to identify facilities that should have notified EPA but had not done so. By the end of fiscal year 1982, at which time Phase II regulations for final status permits were in place, about 9,000 facilities had submitted Part A's and were expected by EPA to require permits. Subsequent identification of protective filers indicated that the initial TSDF universe requiring permits was closer to 6,000 facilities.

Starting in mid-1980 and continuing through 1983, EPA anticipated that interim status would not persist at facilities for very long after Part B applications were called in. Facilities that appeared to be unlikely to seek a final permit would still be subject to final closure requirements and could be forced into compliance by calling in Part B applications and then issuing final determinations. Thus, through 1983 and into 1984, EPA focused on delegating permitting authority to states under the state authorization program and on developing and issuing guidance to the states and EPA regions on the implementation of the RCRA regulations, issuance of permits, and enforcement. EPA issued nearly 20 guidance documents (see Appendix B) and succeeded in creating (sometimes completely from scratch) viable state programs, as well as delegating Phase I authorization to 39 states and Phase II authorization to 25 states by the end of 1983.

Once the Phase II regulations were in place (applications for land disposal facilities were put into place on July 26, 1982, and became effective on January 26, 1983), EPA or authorized states could begin to call in Part B applications. In many cases, EPA attempted to coordinate these call-ins with the state authorization process in order to avoid confusing submittals to both EPA and the state. Unfortunately, the process of reviewing Part B applications did not work smoothly, and EPA was prevented from acting swiftly on many facilities operating under interim status. Many Part B applications were received with insufficient documentation, reflecting inadequate ground-water monitoring and testing, incomplete hydrogeological characterizations, and misunderstanding of the regulatory requirements. On average, approximately three Notices of Deficiency (NODs) were required for each facility before the Part B application could be subjected to a complete review. Also, EPA and the states were still gaining experience with a tremendously complex, comprehensive new regulatory program, as well as preparing clarifications, technical amendments and guidances. Permit writers needed to have a command of many disciplines in order to assess large volumes of diverse technical data (e.g., geologic assessments, chemical tests, placement of ground-water monitoring wells, engineering performance and design criteria, financial responsibility requirements, and safety procedures). These factors tended to extend the permit review process, especially for land-disposal facilities.

The enactment of HSWA on November 8, 1984, substantially affected the permit process, state authorizations, and existing regulations. Among the more significant provisions that affected (and slowed) the permit process were:

- interim-status corrective-action orders [Section 3008(h)], which extended EPA's ability to address potentially hazardous conditions during the period of interim status;
- incorporation of corrective-action measures in permits [Sections 3004(u) and (v)], including corrective-action measures for solid waste management units colocated with hazardous waste units and corrective action beyond the facility boundary;
- loss of interim status (LOIS) [Section 3005 (e)] for land-disposal facilities failing to submit Part B's and to certify compliance with ground-water monitoring and financial responsibility requirements before November 8, 1985;

- interim-status double-liner requirements [Section 3005] for all new units at facilities with waste piles, landfills, or surface impoundments;

- an accelerated permit schedule [Section 3005 (c)], including final determinations by 1988 for land-disposal facilities, 1989 for incinerators, and 1992 for other facilities, for applications before HSWA's date of enactment.

As a result of these new provisions, EPA reoriented its permitting plan. First, while EPA had always emphasized action on "environmentally significant" facilities, HSWA placed a firm emphasis on action at land-disposal facilities. Second, in part as a result of new statutory provisions, EPA combined its enforcement and permitting capabilities under Facility Management Planning (FMP) system. FMP recognized explicitly that environmental results could be obtained either through enforcement (e.g., corrective-action orders) or through permitting action (NODs, permit denials, permit corrective-action requirements and timetables, and closure plan approval). In addition, FMP created a coordinated program for assigning priorities to facilities based on environmental significance.

On November 8, 1985, the LOIS provisions for land-disposal facilities took effect. Of the approximately 1,550 facilities affected by these provisions, about 1,050 failed to certify compliance either with the ground-water monitoring or with financial responsibility requirements. EPA anticipates that additional facilities will choose to close, pending ongoing review and verification of the 500 or so certifications submitted. Consequently, the permitting program over the near term not only must give a high priority to land-disposal facilities seeking final permits but must also deal with the issue of approving closure plans and postclosure permits for the large number of land-disposal facilities that have not sought continued operation. In addition, the program must balance the demands for action at land-disposal facilities with the need to permit incineration and other treatment facilities to ensure that adequate capacity is available to meet not only existing demand but additional demands that may be created by the banning of certain wastes from land disposal. The priorities of the permitting program are discussed in greater detail in Chapter 4.

Accomplishments of the Permitting Program

Identification of Regulated Universe

With the development of the Phase I RCRA program in 1980, EPA and authorized states began the permitting program. Initial phases of the program involved identifying the size of the regulated universe through the process of notification in the case of generators and transporters, and submission of Part A applications in the case of treatment, storage, and disposal facilities. By the end of fiscal year 1982, the universe of generators and transporters stood at approximately 54,000 and 13,000, respectively. Although these figures have fluctuated through time, they have remained fairly constant, standing at 56,002 generators and 12,549 transporters by the end of fiscal year 1985.

As stated previously, approximately 14,500 facilities initially submitted Part A applications. However, many of these were "protective filers" that should not have submitted Part A's but did so largely due to a misunderstanding of the legal requirements. By the end of FY 1984, substantial efforts to identify all remaining protective filers combined with further closures, reduced the universe to be considered for final permits to about 5,000 facilities. Of these, about 3,300 were for storage and disposal, 280 were incinerators, and 1,500 were for land disposal.

Issuance of Permits

In 1982, EPA began the process of authorizing states for the permitting program, and also began "calling in" Part B applications. In that year, as shown in Table 3-3, over 900 Part B applications were "called in." Nearly all of these were from storage and treatment facilities, since these

Table 3-3

PART B PERMITS REQUESTED BY FISCAL YEAR

Type of Facility	Applications Requested by Fiscal Year 1982	1983	1984	1985	June 1986	Total
Storage	879	856	539	135	34	2,443
Incineration	35	121	51	30	7	244
Disposal	7	294	603	514	10	1,428
Total	921	1,271	1,193	679	51	4,115

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* Includes data through June 1986.

SOURCE: U.S. Environmental Protection Agency.

regulations had been promulgated and took effect earlier than those for land-disposal facilities. This number increased to over 1,200 requests in 1983 and maintained similar levels in 1984. However, those years indicated a shifting emphasis from storage and treatment facilities to land-disposal operations. In 1984, land disposal call-ins doubled and represented over half of the Part B submissions requested during that year. In fiscal year 1985, over three-fourths of the call-ins were for land-disposal facilities. Fiscal year 1986 call-ins have slowed considerably to concentrate on the permitting of land-disposal facilities.

Overall call-in activity declined in 1985 from levels of previous years. This was primarily caused by the need to integrate the numerous HSWA requirements into the permitting process, rather than proceeding apace and creating problems for the regulated community that would ultimately slow the progress of permit determinations. By the end of fiscal year 1985, 4,064 permit applications had been requested from a regulated universe that initially numbered about 6,800 (operating or closed) facilities. Early in fiscal year 1986, the LOIS provisions of HSWA increased the number of closed facilities by causing all land-disposal facilities to either submit Part B applications (accompanied by certification of compliance with ground-water monitoring and financial responsibility requirements) or lose interim status by

November 8, 1985. Of 1,550 facilities affected, only about 500 submitted applications and certifications qualifying them for continued status.

Table 3-4 contains information regarding the status of the permitting effort as of June 1986. At that time, EPA estimated that 4,134 facilities would require permits for continued operation. This total consisted of about 3,338 storage and treatment facilities, 280 incinerators, and the 516 land-disposal facilities that had retained interim or permit status after November 8, 1985. Permit applications had been received for about 46 percent of these facilities, including 100 percent of the land-disposal facilities, 64 percent of the incinerators, and 36 percent of storage and treatment facilities. The relatively low percentage of storage and treatment call-ins is due in part to the high priority given land disposal and incinerator facilities in order to meet the congressional deadlines of permitting these facilities by the end of FY 1988 and FY 1989, respectively. Final permits have been issued to 461 facilities, and an additional 42 permits were in the draft stage.

The progress of the permitting program cannot be measured solely by totaling the number of permits issued. RCRA was passed largely in response to the recognition that a large number of sites were not handling hazardous waste in an environmentally sound manner. The permitting program addresses this situation both by permitting facilities that comply with necessary

Table 3-4

PERMITTING STATUS AS OF JUNE 1986

Type of Facility	Operating Universe	Part Bs Called in from Universe*	Part Bs Received from Universe	Final Permits Issued	Notice of Draft Final Determination	Facilities Leaving Interim Status		
						Closures	Denials	Total
Storage and Treatment	3338	1798	1221	424	20	1523***	9*	1532
Incinerators	280	259	178	27	11	29	9*	38
Land Disposal	516	516	516	10	11	1119**	8*	1127
Total	4134	2573	1915	461	42	2671	26	2697

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* Refers to Part Bs called in from universe to be permitted as of June 1986. Cumulative Part Bs called in from beginning of program can be found in Table 3-3. Some of those call-ins would apply to facilities no longer operating as hazardous waste management facilities.

** Includes facilities which closed prior to the deadline for loss of interim status.

*** Includes facilities that store hazardous waste for less than 90 days.

SOURCE: U.S. Environmental Protection Agency.

requirements and by closing facilities that cannot or will not achieve appropriate operating standards. Table 3-4 also contains information concerning the number of facilities that have closed or have been denied permits from 1982 to June 1986. The data indicate that a substantial number of facilities have had to cease their hazardous waste operations during the relatively brief period during which permitting has occurred. About half of these are land-disposal facilities that failed to meet interim-status requirements, but a substantial fraction of the universe of storage and treatment and incinerator sites are also involved. Initial indications are that a large percentage of these sites followed operating practices that had created or had the potential to create environmental harm. The large number of closures has also created a substantial workload for EPA to identify problems at closed sites and initiate appropriate corrective actions as part of the closure process. While difficult and time-consuming, these actions at closed facilities could be of equal or greater environmental significance than similar actions at facilities seeking permits.

An additional accomplishment of the permitting program that is not reflected in numbers of permits and closures is the increased sophistication of the permit writers and the resulting permits issued. RCRA permits are extremely complex documents to produce. They must cover all facility operations;

apply performance, design, and operating standards, rather than using specific numerical targets; and address problems affecting ground water, which is an environmental medium that cannot be seen. To understand and assimilate the information provided in Part B applications, recognize deficiencies, and ultimately develop permits that provide adequate environmental protection, a team of permit writers must represent a wide range of skills, including environmental, civil, and chemical engineering; chemistry; geology; hydrogeology; toxicology; and finance. The complexities involved tend to make the permitting process difficult and lengthy. For permits issued in 1985, the average duration from submittal to issuance was about 600 days. This time period is prolonged to some extent by the deficiencies in Part B applications, which require correction and resubmittal by the owner/operator. However, even without such delays, it is estimated that from 1.5 to 2.0 workyears are required to issue a complete land disposal permit. Recent HSWA provisions regarding corrective action and minimum technical standards have served to increase the effort required. Nonetheless, a major accomplishment of the RCRA permitting program has been to identify areas of particular difficulty, to issue guidance in such important areas as ground-water monitoring, and to develop a larger staff with greater sophistication in the disciplines needed to develop permits.

COMPLIANCE MONITORING AND ENFORCEMENT PROGRAM

When drafting RCRA, Congress intended EPA to have the authorities for inspection and enforcement necessary to ensure that members of the regulated community were meeting the Act's provisions. Several sections of RCRA provided these specific authorities:

- Section 3007 enabled EPA and authorized states (or designated representatives) to have access to
    - facilities generating, transporting, storing, treating, or disposing of hazardous waste;
    - records relating to such waste; and
    - samples of such waste.
- Section 3008(a) provided a number of enforcement powers in cases in which a member of the regulated community was found to be out of compliance with any Subtitle C requirement. Under the powers of this section, the EPA Administrator could issue an order assessing a civil penalty for such violation or commence a civil action. In the case of a violation occurring in an authorized state, EPA is to give the state 30 days notice before issuing an order or commencing a civil action.

- Section 3008(c) empowered the Administrator to assess penalties as part of orders issued under Section 3008(a) that are reasonable in light of the seriousness of the violation and any good-faith efforts to comply with applicable requirements.

- Section 3008(d) set forth criminal penalties for persons who falsify hazardous waste documents or who transport hazardous wastes to or dispose of such waste in a facility that does not have a permit under Subtitle C requirements.

- Section 7003 empowered the Administrator, upon receiving evidence that a hazardous waste generator or handler is presenting an imminent and substantial danger to human health or the environment, to bring suit to restrain the generator or handler from continued endangering practices or to take whatever action may be necessary to correct the situation.

As part of the 1980 amendments to the Resource Conservation and Recovery Act, Congress expanded enforcement authorities by adding two enforcement-oriented sections to Subtitle C. Section 3013 enabled the Administrator to issue administrative orders to compel the assessment of the nature and extent of releases at facilities where information indicates that the presence or release of hazardous wastes may present a substantial hazard to human health or the environment. Section 3008(e) created the ability to bring criminal actions and impose fines against persons who knowingly handle hazardous waste in a way that places another person in imminent danger of death or serious bodily injury.

The Section 3013 powers allowed EPA and authorized states to monitor releases from facilities that would constitute neither an imminent and substantial danger (and thus be addressable under Section 7003) nor a violation of Subtitle C regulations (and thus be addressable under Section 3008). However, as it became clear that facilities would operate under interim status for considerably longer than initially anticipated, Congress felt that the ability to monitor and assess releases at hazardous-waste-handling facilities was insufficient. Consequently, as part of the Hazardous and Solid Waste Amendments, Congress, in addition to clarifying and expanding certain existing authorities, created Section 3008(h) to expand the ability of EPA to deal with such cases. Under this section, the Administrator may issue an order or initiate a civil suit to compel corrective actions at interim-status facilities where hazardous wastes have been released into the environment. The Administrator may also revoke the permit and assess civil penalties for noncompliance with any order.

Thus, as the legislation creating enforcement authorities evolved, an increased emphasis was given to providing authorities to deal with releases to ground water. In particular, the legislation implicitly acknowledged the unexpected persistence of facilities operating under interim status and provided explicit enforcement powers to address releases at such sites. The implementation of the enforcement program and the major accomplishments are discussed in the following sections.

Evolution and Accomplishments of the RCRA Compliance and Enforcement Program

In the initial years of the RCRA enforcement program, from fiscal year 1980 through fiscal year 1982, no distinct RCRA enforcement component existed. Hazardous waste program resources at that time were being devoted to establishing the regulatory framework. The enforcement activities that took place were by a Hazardous Waste Enforcement task force that focused on RCRA matters under Section 7003 authorities and on Superfund cases. Inspections of hazardous waste handlers were under way during the period, but were primarily conducted under unauthorized state programs, and focused to a large degree upon generators and transporters of hazardous waste. During that period, EPA began to build the basis for regional and state enforcement programs by issuing guidance documents regarding the use of enforcement authorities under Sections 3008(a), 3013, and 7003.

Fiscal year 1983 was the first full year in which the core regulations of the RCRA program were in place. In particular, during this fiscal year, the interim-status ground-water regulations went into effect, and the inspection of facilities subject to these requirements became a major enforcement priority, with 30-40 percent of state grant monies to be dedicated to the overall enforcement effort.

What EPA learned through inspection results and through subsequent analysis was that major problems existed in the area of ground-water monitoring. Not only did this effort indicate that a high degree of noncompliance existed in the regulated community, but it also made EPA aware that developing effective ground-water monitoring and assessment programs was a far more complex technical issue than EPA had previously thought. Issues of characterizing site hydrogeology, collecting adequate samples, and properly analyzing the samples collected were a result of the technical state of the art. Thus, the basic regulations requiring at least one well upgradient from a site and a minimum of three wells downgradient were exposed as far too general to adequately protect ground-water resources.

EPA also began to realize that the complexities inherent in the hazardous waste regulations were going to prolong the period needed to process Part B applications and issue permits. Thus, many facilities would be operating under interim status for significant periods of time, and the permitting process would not be sufficient to address facility releases in a timely manner across the regulated universe.

As a result, a separate RCRA enforcement unit that had been formed within the Office of Waste Programs Enforcement (OWPE) and that had grown to nine people by the end of 1983 began to focus on how enforcement could alleviate the problem of noncompliance under prolonged interim status. A major effort was made to develop a National Compliance and Enforcement Strategy that would accelerate the submission of accurate and complete Part B submissions, and that would establish an effective and visible enforcement presence at the regional and state levels.

These objectives were reflected in the RCRA Implementation Plan (RIP) for fiscal year 1984. This plan specified that all facilities subject to ground-water monitoring were to be subject to "comprehensive inspections to assure compliance with the interim status standards, especially the ground-water monitoring, closure, post-closure, and financial responsibility requirements," and made such facilities the top national inspection priority. The RIP indicated that regions and states were to undertake enforcement actions, such as warning letters or administrative orders, in all cases of noncompliance.

During fiscal year 1984, an expanded OWPE staff (that grew to 30 by the end of the year) worked to develop the infrastructure for a cohesive, comprehensive, and effective national program. These efforts focused on nearly all aspects of the compliance and enforcement program.

- A RCRA Civil Penalty Policy was developed to systematize the assessment of penalties under 3008 authorities. States were also surveyed to determine which had administrative penalty authorities.
- Work was completed in August 1985 to provide guidance on how to write a comprehensive ground-water compliance order. This was accompanied by the initiation of a Technical Enforcement Guidance Document (published in draft in 1985), which would assist enforcement personnel and permit writers in defining an adequate ground-water monitoring system.
- An assessment of needs for a technical enforcement program was performed, including necessary inspection manuals, field guides, and the identification of performance standards in regulations requiring extensive technical guidance.

- A Program Quality Criteria document was developed, which established performance expectations for regions and states.

- Questions were developed to help states describe the enforcement program and evaluate its effectiveness.

- A RCRA Compliance/Enforcement Guidance Manual, consisting of a compendium of all enforcement guidance procedures, was produced for the regions and states.

The above activities clarified the enforcement roles of the state and federal governments, strengthened enforcement programs at state levels, and improved the abilities of enforcement personnel at all levels to deal with the legal and technical complexities inherent in the RCRA program.

During 1984, staff at OWPE also began work on a document that would clearly present EPA's priorities for enforcement activities. This effort resulted in the Enforcement Response Policy, which was issued in December of 1984. The policy strengthened the enforcement program by concentrating its efforts on the most serious violators and by setting forth enforcement sequences and timetables to deal effectively with such facilities.

Fiscal year 1985 marked the first entire year in which the enforcement program could be considered fully operational under the management structure established in fiscal years 1983 and 1984. Not only had previous years' efforts resulted in an effective organizational structure operating under sufficient guidance, but the work on the Enforcement Response Policy and the RCRA Implementation Plan had resulted in an enforcement effort that focused on major waste handlers with violations of ground-water, closure, postclosure, and financial responsibility requirements.

Accomplishments of Compliance Monitoring and Enforcement Program

The enforcement program for RCRA activity has grown steadily and has refined the focus of its activities over time. The initial focus of the effort was to support authorized states in implementing compliance monitoring and enforcement programs, and to assist states in the inspection effort required to identify compliance problems in the regulated universe. As the program expanded and EPA and authorized states gained a greater understanding of the nature and significance of the compliance problems, the enforcement effort was able to classify sites and to set priorities for conducting enforcement actions.

A series of policies were issued in fiscal years 1984 and 1985 that established a framework for a consistent, equitable, and responsible enforcement program. This Enforcement Response Policy set forth appropriate responses for various types of violators. Under this policy, violators of RCRA requirements are separated into three groups. High priority violators are those handlers with one or more Class I violations of closure, post-closure, financial or financial responsibility requirements who either (1) pose a substantial likelihood of exposure to hazardous waste, (2) has caused actual exposure, (3) has realized a substantial economic benefit as a result of non-compliance, or (4) is a recalcitrant or chronic violator (including a handler who is violating schedules in an order or decree). Class I violators are handlers with one or more Class I violations who are not a High Priority Violator. Class II violators are handlers that have such violations as failure to make emergency arrangements with local authorities, failure to maintain a copy of a closure plan at the facility or failure to submit the biennial report.

High priority violators must be addressed with administrative orders or judicial actions within three months of violation discovery; penalties should be assessed as well. The remaining violator groups are to be addressed in longer timeframes (generally) and enforcement may be initiated at lower levels.

The impact of the increased understanding of the nature and importance of various handlers and violations, and the increased focus on ground-water-related violations is reflected in both the inspection and enforcement efforts. As early as 1981, a significant number of inspections, 7,891, were being undertaken under the RCRA program. In 1982, the number more than doubled to 15,877; a number that compares favorably with the 16,098 inspections conducted in 1985. However, it would be a significant error to conclude that the similarity in the number of inspections indicated nearly equivalent inspection efforts. From 1982 to 1985, major changes occurred in the nature and quality of inspections. First, inspections in 1985 were focused largely on major handlers and other facilities requiring ground-water monitoring, where noncompliance would have the potential for the greatest environmental harm. Second, and perhaps more important, inspections by 1985 had grown tremendously in sophistication and focus. In the early years of the program before the complexities of ground-water problems were fully understood, inspections focused on whether facilities subject to ground-water monitoring had installed wells. By 1985, one-third of ground-water monitoring facilities were subjected to Comprehensive Ground-water Monitoring Evaluations, which are detailed investigations of a facility's hydrogeological conditions, including well structure and creation, ground-water monitoring systems, and a facility's sampling and analysis program. In addition, other inspections consisted of detailed reviews of facility records to ensure that closure plans had been developed, closure costs had been estimated, and the compliance with requirements was being attained. Consequently, inspections were designed to identify the most significant types of violations at the most significant types of facilities.

The impact of the improved inspection program can be witnessed from results as recently as 1984 and 1985. In 1984, the compliance monitoring effort conducted 4,579 inspections at major handlers and identified 1,275 Class I violations. In 1985, out of the 16,098 total inspections, 5,497 were of major handlers. These identified 1,691 Class I violations at major handlers. Thus, in both 1984 and 1985, approximately one major violation was being found for every three inspections.

The increase in formal enforcement to address Class I violations discovered by these inspections is evident in the FY 1984 and FY 1985 statistics. In 1984, EPA issued 354 §3008(a) administrative complaints in addition to the States 352 administrative orders to major handlers. Thus, at least 55% of the Class I violations were addressed with formal enforcement actions. In 1985, EPA issued 239 §3008(a) administrative orders. Thus, at least 65% of the Class I violations were addressed with formal enforcement actions; an increase of 10% from 1984 to 1985. These figures do not include EPA orders issued under other RCRA authorities or any judicial actions by the States or EPA. The decrease in EPA enforcement actions and the concomitant increase in State enforcement actions is primarily a result of the increasing reliance on newly authorized State programs.

The increased emphasis of the inspection program on major handlers and major violations was consistent with the overall focus of the enforcement effort on correcting non-compliance at Significant Non-Compliers (SNC's); i.e., those major handlers with Class I violations of closure/post-closure, ground-water monitoring, or financial requirements. The major focus of enforcement in 1985 was to take the enforcement actions needed to bring facilities known to be SNCs at the beginning of the year into physical compliance and also to address non-compliance at SNC's identified during the year. The success of this effort is presented in Table 3-5. Information in the table indicates that of 3,004 facilities identified as major handlers, 706, or nearly 25 percent, had been identified as being in significant noncompliance. During fiscal year 1985, 480 formal actions were taken against the universe of facilities, which when combined with previous actions addressed the problems at 634 sites, or 90 percent of the facilities. Compliance efforts also brought 18 out of 25 federal facilities that were beginning of year SNCs into compliance.

The focused compliance monitoring effort undertaken during 1985 identified a number of violations that turned

Table 3-5

1985 ACTIONS AGAINST SIGNIFICANT NONCOMPLIERS

	All Facilities	Federal Facilities
Major handlers	3,004	139
Beginning of Year (BOY) Significant Noncompliers (SNCs)	706	25
Formal Actions against SNCs from Previous Years that Have Not Returned to Physical Compliance by10/1/85	210	6
Formal Actions Taken in FY 1985 Against BOY SNCs	480	11
Major Handler Facilities Addressed by Formal Actions	634	--
BOY SNCs that Returned to Physical Compliance in FY 1985	327	18
Newly Identified SNCs	551	41
Formal Actions against Newly Identified SNCs	144	16
Newly Identified SNCs Returned to Compliance	112	13
End of Year SNCs[1]	818	35

SOURCE: U.S. Environmental Protection Agency.

1/ Derived by subtracting BOY SNCs returned to compliance from BOY SNCs, adding newly identified SNCs and then subtracting newly identified SNCs returned to compliance.

551 facilities and 41 federal facilities into SNCs during the year. Enforcement actions taken during the year caused 112 of these and 13 of these federal facilities to return to compliance.

The information in Table 3-5 documents the result of an enforcement effort focused on addressing the population of facilities of the greatest environmental significance. However, the data also indicate the major challenges facing the enforcement and permitting programs due to the widespread noncompliance by the regulated universe. Among facilities, nearly 25 percent were violating a significant provision at the beginning of 1985. In spite of an intensive and effective effort to return this group to compliance, additional SNCs identified during the year caused the end-of-year population of SNCs to grow to 818 facilities. A similar situation occurred for federal facilities whose SNC population increased from 25 to 35 during 1985. These numbers may be somewhat misleading, since more SNCs were addressed through enforcement actions during 1985 than were identified and, hence, on-net progress was being made to bring this population into regulatory compliance. However, the breadth and persistence of noncompliance on the part of the regulated community is a major factor that will continue to affect enforcement activities and all other aspects of the hazardous waste regulatory program.

Future Priorities of the Enforcement Program

Looking forward, the enforcement program has several near-term priorities. One is to continue efforts to bring SNCs into compliance -- in particular, those SNCs that present an immediate threat to health or the environment and those SNCs with inadequate or nonexistent ground-water monitoring systems. Another major priority is to coordinate enforcement program efforts with those of the permitting program to assist in the effort to issue or deny permits for all land-disposal facilities as required by HSWA. This coordination is also required to permit new treatment capacity to help ensure that adequate capacity exists to handle existing wastes and wastes that may be restricted from land disposal. Finally, the large number of land-disposal facilities that have lost interim status due to failure to comply with the requirements of HSWA by November 8, 1985, has created a sizable universe of sites that must be properly closed. The enforcement effort intends to monitor the progress of closure closely at these sites and to take formal enforcement actions to bring facilities into compliance with closure requirements when needed. These priorities and the impact of HSWA on the enforcement program are discussed in greater detail in Chapter 4.

PRIORITIES FOR THE HAZARDOUS WASTE PROGRAM CHAPTER 4

Priorities for the Hazardous Waste Program can be grouped into four distinct areas of activity. These are:

- Implement existing regulations to get facilities cleaned up to continue operation or to close.
- Implement HSWA to fill gaps in environmental protection.
- Provide remedies where our existing regulations do not work, confuse, or hinder.
- Start today to lay a foundation for an integrated technology performance/risk-based future system.

IMPLEMENT EXISTING REGULATIONS

There are currently more than 4,100 RCRA treatment, storage, and disposal facilities that require operating permits. Five hundred of these are land-disposal facilities that want operating permits, 280 are incinerator facilities, and the rest are treatment and storage facilities. In addition, there are approximately 2,700 facilities that have ceased operation that must be addressed -- including 1,000 land disposal facilities that closed or were forced to close because they failed to comply with HSWA operating requirements. At a very high fraction of these operating and closed facilities, the regulated unit or other solid-waste-management units on the property have contaminated the ground water in the area. Unless significant progress is made in cleaning up contaminated areas and permitting new facilities, a capacity shortfall in safe disposal alternatives could occur. For this reason, EPA has identified the following four priorities.

- Focus our resources on the highest-risk facilities. Our permitting, monitoring, and enforcement resources must be integrated to address those facilities posing the greatest known or potential risks. In view of their limited resources, states and regions need a system they can use to rank facilities on the basis of the risks they can pose and to address the potentially high-risk facilities first. Facility management plans for all types of facilities will form a basis for an integrated implementation program.

- Speed permitting for new and existing facilities. This priority can be carried out in numerous ways, including using integrated enforcement and permitting authorities, establishing teams of multidisciplinary professionals to assess each facility, having earlier and increased face-to-face discussions with permittees, and applying simpler, more timely guidance from EPA Headquarters that reflects considerable input from regional and state participants. This guidance should include case studies and should be field tested. Also, in the face of uncertainty, permit-writing teams must use their best professional judgment on whether to close a facility or to grant it a permit to continue or start operating. Some mistakes will result, but the price of reducing uncertainty to zero is an unacceptably slow permit program. Permits are living documents and can be revised as better information is obtained.

- Implement a workable corrective-action program. The RCRA corrective action program for closing facilities and cleaning up existing contamination at operating facilities should parallel implementation of the Superfund program, but should simplify it wherever possible. The authorities under RCRA, CERCLA, and the Toxic Substances Control Act should be used together so that major contamination can be cleaned up on a facility basis, rather than a unit-by-unit basis at each facility. Permitting and delisting required for cleanup should be subject to expedited procedures. Cleanup levels and priorities should depend on the risk the contamination is posing to people and the environment.

- Speed delegation of the full RCRA program to the states. In many instances, states can be more responsive than the federal government to risks posed by hazardous waste, since they are closer to the problem. The achievement of authorization strongly suggests the state's commitment to implement a strong program. The state authorization process should be designed to evaluate performance rather than regulatory procedures. As states take on full responsibility for day-to-day implementation of RCRA, EPA must receive more information on how states are selecting priorities and how the environment has improved. The tradeoff for more flexibility in state decision-making is better information at the federal level. The state grant negotiation process should reflect these considerations.

FILL GAPS IN ENVIRONMENTAL PROTECTION BY IMPLEMENTING HSWA

The HSWA requires EPA to implement a series of short-deadline regulations, longer-term regulatory remedies, and reports to Congress. In total, HSWA places 72 requirements on EPA. Following are the highest priorities.

- Ban untreated hazardous waste from land disposal. Under HSWA, untreated hazardous wastes are banned from land disposal unless it can be shown no migration from the disposal unit will occur for as long as the waste remains hazardous. EPA is in the process of promulgating regulations to implement this important and far-reaching program. These regulations will dramatically change the amount and nature of land disposal, will help to prevent the need for future Superfund cleanups, and will create demands for alternative treatment and disposal technology.

- Control burning and blending of hazardous wastes. Burning hazardous waste in industrial boilers and burning off-specification fuel or hazardous waste in nonindustrial boilers will be curtailed or controlled under HSWA. These requirements will reduce exposures in densely populated settings and should ensure that waste banned from land disposal will not go into the air.

- Regulate air emissions. Controls will be developed for air emissions from all treatment, storage, and land-disposal facilities. This will be particularly important as more volatile wastes are controlled by treatment technologies, rather than by land disposal. Moreover, unlike ground water, which moves slowly, air emissions can result in exposures almost immediately.

- Expand the definition of "characteristic waste." The current definition of "toxic characteristic waste" focuses primarily on metals and not on organics. Expanding this definition will bring significant amounts of organic waste into the Subtitle C system.

- Tighten the hazardous waste tank regulations. There are currently 15,000 hazardous waste tanks, plus an approximately equivalent number of tanks used by generators of small quantities of hazardous waste. Without stricter regulations, these facilities can release harmful levels of contaminants to ground water. Moreover, as land-disposal regulations are tightened, treatment in tanks should increase.

- Revise Subtitle D regulations. Large quantities of waste are disposed of through the nation's non-hazardous waste system. This includes hazardous wastes from households and small-quantity generators, and waste that may later be brought into the hazardous waste system. Both incineration and land disposal of these wastes can pose significant risks if not handled and sited properly. Current regulations must be examined and revised where appropriate.

PROVIDE REMEDIES FOR INEFFECTIVE CURRENT RULES

The current regulatory structure is relatively inflexible and complex, and has definitional inconsistencies within itself and with other environmental laws. The following existing regulatory areas are the highest priorities for short-term fixes.

- Examine our current permitting regulations and review practices. Not all parts of our permitting regulations have an equal effect on protecting the public health and environment. Various parts of these regulations can increase or decrease in importance based on location, waste handled, proximity to population, atmospheric conditions, etc. Our base RCRA regulations must be examined in light of regional and state experiences to identify these areas, examine permitting/enforcement tradeoffs, and issue guidance to both the applicant and permit writer to foster a more streamlined and efficient permitting program.

- Amend the Subpart F ground-water regulations. Implementaiton of the ground-water regulations must be amended by addressing problems within the scope of monitoring requirements, indicator parameter selection, definitions of "point of compliance" and "uppermost aquifer," and use of statistical tests.

- Strengthen clean-closure regulations. Regulations on clean closure of characteristic waste at facilities must be strengthened to ensure protection of ground water.

- Allow greater flexibility for permit modifications. For faster permitting and adequate disposal capacity, more flexibility is needed in modifying interim-status and final permits, without requiring the submission of major permit application requirements.

- Permit mobile treatment units. Mobile treatment technology can greatly expand the current capacity for handling hazardous waste and can reduce generator liability problems. More flexibility is needed to allow already proven technology to be used quickly at new sites.

- Coordinate pesticide rinsate regulation. Better coordination between the regulations under RCRA and the Federal Insecticide, Rodenticide, and Fungicide

Act is needed to avoid inconsistent regulation of dilute pesticide washwater and to identify treatment technologies that render these washwaters nonhazardous.

- Eliminate the dilemma of regulating radioactive waste. Currently, EPA cannot delegate regulation of mixed waste (radioactive plus RCRA waste) to authorized RCRA states and cannot regulate such waste in delegated states. EPA must write regulations and authorize states for mixed waste to close this loophole.

- Simplify the definition of hazardous waste. The current definition is confusing and difficult to interpret. EPA must examine this problem and revise our definitions to allow the regulated community to know what wastes fall under regulation.

LAY A FOUNDATION FOR AN INTEGRATED TECHNOLOGY PERFORMANCE/RISK-BASED SYSTEM

Even with these corrections to the existing regulatory structure, the current approach to regulating hazardous waste is suboptimal because of its complexity and inconsistencies. The following work is needed now to design an effective system for the longer term.

- Ensure consistency among different disposal methods. The nation's hazardous waste system should ensure that wastes do not all move to the least regulated part of the system. The system must be considered as a whole. For example, releases from facilities permitted under the air and water regulations should be regulated consistently with RCRA waste requirements.

- Regulate wastes and products consistently. Instances may exist where incinerated wastes are controlled, but emissions from air stacks in manufacturing plants are not. Ideally, these differences should be carefully reviewed and minimized.

- Examine the listing and delisting approach and definition of "hazardous waste." More than 60,000 chemicals are manufactured or used today, creating an even greater number of distinct waste streams. Obviously, EPA cannot review each of these. A simplified constituent-specific, concentration-based definition of "hazardous waste" would eliminate the need for time-consuming listing and delisting of waste streams.

- Encourage waste minimization. Besides being economically and environmentally advantageous, focusing on minimizing waste shifts more responsibility to waste generators. EPA needs to consider regulatory and nonregulatory options in this area.

- Identify incentive-based private-sector approaches. These approaches include environmental auditing and insurance schemes based on the levels of risks facilities may pose.

THE CHALLENGE OF IMPLEMENTING HSWA CHAPTER 5

This chapter discusses the problems that EPA may face over the next several years as it attempts to achieve the objectives and requirements of RCRA. Probably the most difficult problem EPA faces is the setting of priorities. The previous chapter has identified program priorities for four distinct areas of activity. These priority activities are based on achieving the greatest environmental results with our resources. If we are to succeed, however, the use of an integrated technology/risk-based approach should be adopted wherever possible because such a process offers several benefits that result in a more effective and efficient regulatory structure.

Historically, RCRA has been implemented primarily as a technology-based program to prevent future releases of hazardous waste. The current framework places most of the emphasis on the type of facility managing the waste, without considering such factors as hydrogeological conditions, current and future use of ground water, and the waste's toxicity, volume, transport, and fate. A risk-based approach, in conjunction with technology performance standards bridges that gap. The approach provides several necessary benefits to implementing the hazardous waste program.

The process allows priorities to be set that maximize environmental results. By defining the severity of the problem, this approach allows decision makers to make choices as to which problems to address first. This is particularly important today when constrained resources require EPA to make choices both among and within regulatory development and implementation activities.

Developing information that encompasses both technology and risks informs the public on exactly what we are doing and why we are doing it. While the public is concerned about technology controls, they are equally concerned about the potential effect of a release, high emission rates, or an accident on their health. Developing and providing this information responds directly to community concerns. The process establishes a common framework for identifying the most important questions, identifying and evaluating possible controls for review by both the permit applicant, permit writer, and general public. This process incorporates into the decision-making process additional information that helps define the nature and extent of the problem such that more effective decisions can be made.

Overall, this approach focuses attention on achieving the biggest payoff and ensures that technology, while critical to control, will not force control to toxicologically insignificant exposures. Finally, this approach ensures that total risks are minimized across all environmental media and that technology is not used merely to transfer pollution from one medium to another.

The challenge for the future is to simplify the implementation of existing provisions and to examine new opportunities for considering risk in conjunction with technology. However, it is important to recognize that in preventing future releases, technology controls will continue to play a critical role. Because it is obviously desirable and cost-effective to prevent future problems, technology, coupled with available risk information, must be applied without delay.

Examples of new technology performance/risk-based decision opportunities include the following:

- Regulations on tanks containing hazardous waste could vary based on tank owners with high or low-risk hydrogeological situations or with high or low toxicity wastes.

- Technology performance controls on land-disposal facilities could vary based on whether wastes being disposed of are highly or less toxic due to degree of pretreatment.

SEVERAL STEPS ARE NECESSARY FOR USING AN INTEGRATED TECHNOLOGY PERFORMANCE/ RISK-BASED DECISION MAKING FRAMEWORK

Successful implementation of a technology performance/ risk-based decision-making program requires that the EPA place a greater emphasis on the following activities:

Get better data. Additional data on the toxicity and fate of waste constituents are critical for effective risk-based decision making. The data-gathering provisions of the Toxic Substances Control Act and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) can be used to require chemical and pesticides manufacturers to generate these data. And EPA's research program can play a critical role in producing data on the effectiveness of innovative technology in reducing exposures. These data can improve our ability to set operational priorities for controlling future hazardous waste and for cleaning up existing problem areas.

Continue to develop and validate fate and exposure models. Research is needed to develop improved models for predicting the environmental exposure from various technologies, management practices, and waste types. Once developed, the models must receive widespread review by technical experts.

Develop regulations that create incentives for producing lower-risk waste. Not all wastes, sources of water, and disposal sites are the same. High-risk wastes and facilities can be discouraged through more stringent control requirements. In addition, regulations that exempt or reduce regulatory requirements on lower-risk facilities and generators are highly desirable. Waivers or site- and waste-specific petitions are one way to accomplish this, if they can be developed and decided upon quickly.

Develop standard, simplified procedures for decision making. The key to a simplified system is that the amount of information required must relate to the amount of environmental harm that comes from a wrong decision and the uncertainty surrounding that decision. In most cases, estimates and uncertainty ranges can be used in place of data. These uncertainty ranges are essential to understand the possible outcomes and the likelihood of those outcomes occurring. For example, for each site/waste decision, a requestor can have a tailored set of data and modeling requirements. As a first cut, a requestor can use simple models and assumptions with uncertainty bounds where he does not have site-specific data.

If his results show a small band of uncertainty, he need not spend more time or resources. A decision (grant or deny) can be made at this point. If his results show a large band of uncertainty, the applicant will need to obtain better site-specific data to see if he can narrow this wide range. If unable to, he can choose to use more sophisticated models with more extensive justification.

Develop training programs to educate the EPA, states, and public in using technology performance/risk-based decisions. Different training materials are needed for educating EPA and state employees, petitioners, and the public. The training should focus on how EPA develops hazard, exposure, and risk estimates and then combines these elements with other information (such as technology performance, cleanup time and use of the contaminated resource) to decide how to sufficiently protect public health and the environment. Besides training existing personnel, EPA and state agencies need to hire employees with skills in the risk field -- toxicologists, modelers, and people with risk communication expertise to complement our engineers and to educate the public about this process.

OTHER PROBLEMS AND CHALLENGES ALSO EXIST

The Regulatory Structure Also Requires Changes

The current regulatory structure is unnecessarily complex. This complexity of the RCRA rules is intimidating and can lead to inconsistent regulatory protection. Only an expert familiar with the rules can determine which wastes and which facilities they cover. The result has been a system with many definitional boxes that sometimes blur together and sometimes result in huge inconsistencies.

Similarly, our facilities standards too often focus in voluminous detail on the means of carrying out regulations and not the "end," which is a healthy population and a clean environment. Unlike the air and water programs which primarily concentrate on emissions or effluent standards, the RCRA program consists primarily of detailed design, operating, and performance standards that encompass the entire facility. A permit application can run from 100 pages for a small, single-process facility to over 2,000 pages for a multipurpose facility. Taken together, this complexity is a major reason why few land disposal permits have been issued to date.

The challenge to EPA is to correct these inefficiencies by, among other activities, implementing an integrated facility management planning system, supplying more efficient and timely guidance to regional and state personnel as well as to the regulatory community, increasing communication and technical assistance to this community, and working more closely with interested parties as we develop future regulations.

Potential Cross-Media Impacts Require Careful Risk Assessment

Implementation of new HSWA requirements is likely to result in banning the land disposal of hazardous wastes unless they are first treated. These land bans may also require destruction technologies, like incineration, to be used before the wastes can be land disposed. As these land ban decisions are implemented, the potential exists for other environmental risks to increase by transferring solid waste hazards to other media (e.g., water effluents from treatment processes, or incineration exhaust). EPA is currently addressing potential cross-media impacts by performing comprehensive assessments that cover multiple media wherever possible. For example, EPA is investigating whether improvements can be made to Federal categorical standards and local pretreatment controls to enhance control of hazardous wastes discharged to sewers. EPA is also examining the impact of air emissions from technologies used to treat hazardous wastes. EPA's assessments will often be limited by the adequacy of current inter-media technical understanding. EPA intends to meet the land-ban deadlines imposed by HSWA even if these assessments are incomplete; thus, EPA may be forced to exercise a substantial degree of technical judgment using available information in order to complete the land ban provisions on time.

EPA Must Reconcile Multiple Ground-water Protection Approaches

EPA's current and future regulatory strategy for disposal of hazardous waste embodies four potentially overlapping components:

1. technical standards (e.g., double liners and leachate collection);

2. location standards (e.g., with respect to nearby aquifers, floodplains, earthquake zones, and unstable geologic formations);

3. land bans and associated pretreatment standards; and

4. monitoring, enforcement, and corrective action.

In some cases, regulations and guidance for each component are developed under the environmentally conservative assumption that other sources of protection will fail. For example, land-ban regulations will be based on an assumption that liners will ultimately fail and that ground-water monitoring will fail to detect a release. To some extent, these different lines of defense address circumstances that may occur at different points in time (e.g., enforcement and technical standards provide near-term protection, while land bans and locational standards provide long-term protection). In addition, the reconciliation of multiple protection strategies requires detailed assessments of technical performance that are often unavailable (e.g., the long-term performance of liners or landfill caps is uncertain, as is the duration and effectiveness of postclosure institutional care). However, imposition of all of these requirements at every site could prove to be enormously expensive.

As technical performance and the risk associated with this performance become better understood, EPA may need to revise its standards. For example, factories that must be sited at specific locations for other economic reasons (e.g., near a river for transportation) may be unable to comply with locational standards, even though they use facilities that otherwise comply with pretreatment requirements and technical standards. As locational standards, land bans, and new enforcement powers are implemented, EPA will need to consider the applicability of these different environmental protection mechanisms.

The Potential Lack of Adequate Disposal Capacity Makes Permitting Vital

The existing supply of hazardous waste disposal capacity is not known with certainty. However, current conditions and trends suggest that a disposal capacity shortfall is relatively likely, at least at a regional and technology-specific level. A number of conditions create this situation. Currently, the pace of permitting of new facilities is relatively slow, while facility closures are increasing rapidly. In 1985 alone, approximately 1000 land disposal facilities closed or were forced to close because they failed to meet congressionally mandated operating requirements (by not complying with ground-water monitoring and financial assurance requirements, and by submitting Part B applications for a final permit). Conversely, only ten disposal facilities have received final permits to date. Of the nearly 500 land disposal facilities that apparently retained interim status, EPA expects that many more will ultimately lose interim status as certifications and Part B applications are reviewed.

While new capacity additions are slow and capacity closures apparently rapid, new regulatory requirements will also shift the mix of capacity needed (from landfilling to treatment and incineration). Evidence that incineration capacity is already in short supply is relatively strong (i.e., operating rates in excess of 90 percent and rapid price increases). In addition, phase-out of PCB-containing electrical equipment has created a large demand for incineration capacity, together with CERCLA cleanup actions, which competes with normal incineration demand from ongoing hazardous waste generation activities. In other cases, while capacity may remain available, fewer sites continue to accept waste. As a result, generators are forced to transport waste over a longer distance at higher cost.

EPA has a multi-pronged strategy nationwide to address the potential capacity shortfall. First of all, by conducting a capacity study EPA will be in a much better position to determine where and when capacity is a real problem. Furthermore, EPA has assigned the permitting of alternate treatment facilities a high priority. Finally, through its RD&D permit program and Technology Transfer Task Force, EPA is encouraging development of new capacity.

Insurance Availability May Be Limited in the Short Term

Subpart H of 40 CFR Part 264 regulations requires hazardous waste management facilities to maintain insurance to cover potential property damage and bodily injury. (No requirements currently exist for unexpected corrective action costs that may be incurred during operation or closure.) Recently, many facilities have complained that they were unable to obtain the necessary insurance at reasonable cost.

Of the land-disposal facilities that failed to certify compliance with the financial responsibility provisions of RCRA on November 8, 1985 (and thereby lost interim status), about 45 to 50 would have complied but for lack of financial insurance. While the insurability of these facilities is unclear, as is the actual availability of adequate insurance, it is at least true that insurance providers have recently suffered large property and casualty losses, and that many no longer offer insurance or have raised rates substantially. As a result, the effectiveness of the insurance industry as a private sector mechanism to help assure environmentally acceptable hazardous waste management is currently limited.

In the short term, EPA is attempting to assist qualified hazardous waste management facilities in identifying insurance providers and providing a regulatory package to authorize the use of a corporate guarantee as a method of demonstrating compliance with liability requirements. EPA is also investigating the use of other instruments such as indemnity contracts and letters of credit. However, EPA's long-term strategy is to foster private sector involvement as much as possible by (1) monitoring sites to assure regulatory compliance, (2) encouraging insurers to adopt risk-based measures in policies, and (3) helping to identify "good risks" through the permitting and enforcement programs. EPA also maintains a list of companies currently offering environmental impairment insurance, and offers assistance to promote companies seeking to form risk retention pools.

Treatment of Federal Facilities Requires Special Consideration

Federal facilities that dispose of hazardous waste have certain unique features that require EPA's special attention concerning permitting, enforcement, and compliance monitoring. The Constitution prohibits any federal agency from taking judicial action against another federal agency. However, EPA can issue administrative orders and compliance agreements just as for any other facility. EPA is currently working with DOD and DOE to resolve problems related to the management of hazardous waste (RCRA) and special nuclear and byproduct waste (Atomic Energy Act). In the case of DOE facilities, many disposal sites were designed for dealing with radioactive waste (from the weapons program and other research activities) in a manner that does not conform to current hazardous waste disposal technical standards. Similarly, permitting of federal facilities currently requires that corrective actions occur at all solid waste management units (SWMUs) with releases of concern anywhere in the same facility (defined to include all contiguous property under single ownership). Since many federal "facilities" are very large (sometimes hundreds of square miles), assessment of all SWMU's will be difficult.

EPA is currently in the process of developing a regulatory package that addresses three issues that pertain to permitting federal facilities. The first issue addresses the question of who "owns" a federal facility. The second issue addresses concern that a federal agency could be held responsible for corrective action on lands that an agency transferred to another party. The third issue concerns national priorities and limited resources and the need to address these resources to the most contaminated sites first.

Another issue pertains to regulating radioactive mixed wastes that are subject to RCRA and the Atomic Energy Act. EPA is currently issuing a notice requiring states to develop programs, or update programs, to manage and regulate the hazardous components of radioactive mixed wastes.

EPA's Regulations Operate at the Cutting Edge of Technology

As hazardous waste management requirements become increasingly more protective, reliance on advanced technical processes increase (especially on continuous testing and performance monitoring technologies). In many cases, hazardous waste management techniques are extensions of well-known processes (e.g., landfilling, chemical treatment, and incineration); however, current regulations require these processes to be conducted in a far more controlled manner. For example, experience with the performance of plastic membrane liners in landfills and surface impoundments (especially in contact with a wide variety of hazardous materials), and with incinerators reaching 99.99 percent destruction and removal efficiency, is still relatively limited. In other cases, the processes themselves are very new (e.g., plasma-arc and high-pressure hydrochemical destruction technologies). Since the performance of new and existing technologies plays a fundamental role in EPA's regulatory effort, ongoing technology assessment is vital to the program.

EPA is using a number of initiatives to address new technology. EPA is working to streamline the permitting process to facilitate recognition of technology change, and is developing an improved RD&D permit program under HSWA. In addition, EPA is in the process of instituting the Superfund Innovative Technology Evaluation program (SITE) in order to foster alternative technologies and capitalize on its experience at CERCLA sites. Additional programs are also underway to develop exposure modeling techniques in order to aid the use of an integrated technology/risk-based management approach.

Lack of Compliance in the Regulated Community Requires Aggressive Enforcement Action

While EPA has made substantial progress in bringing sites into compliance with hazardous waste regulations, and has closed a large number of sites not in compliance, EPA's enforcement task remains large. In 1985, EPA designated 706 as "Significant Non-Compliers" (SNCs) at the beginning of fiscal year 1985, and thus assigned these sites a high priority for enforcement action. Inspections and follow-up activity by EPA and authorized states ultimately resulted in 690 enforcement actions for SNCs during fiscal year 1985. While EPA's SNC designation focuses on major land-disposal facilities, EPA suspects that a greater fraction of all Subtitle C facilities are, in fact, out of compliance with some portion of current regulatory requirements, perhaps as high as 30 percent. These requirements include the ground-water monitoring provisions of Subpart F regulations, the closure provisions of Subpart G, and the financial responsibility provisions of Subpart H.

In the legal sense, waste management facilities are only required to comply with the regulations EPA sets forth. However, economic considerations provide an incentive to the facility operators and generators to achieve compliance at the minimum level possible. To some extent, this tendency towards minimum compliance impedes EPA's ability to achieve the environmental objectives of RCRA. For example, EPA suspects that some land-disposal facilities (e.g., surface impoundments that would require liner retrofits) never intend to comply with the technical standards of 40 CFR Part 264 regulations for fully permitted facilities. However, these facilities are able to retain interim status until the final permitting process is complete (for up to two more years). Furthermore, EPA has found that final permit applications (Part B applications) often arrive with insufficient technical information. Thus, EPA must request more information in a time-consuming iterative fashion, which tends to delay the date by which the facility must achieve full compliance with the 40 CFR Part 264 technical standards.

EPA has implemented a number of strategies to enhance the effectiveness of its enforcement actions. In addition, with the corrective action capability EPA now has (Section 3008(h) added by HSWA), EPA is in a much stronger position to enforce its regulations aggressively, even during the period of interim status. EPA's FMP program is the primary mechanism for efficient coordination of enforcement effort. In addition, EPA is focusing on creating a publicly visible enforcement presence in order to create a credible deterrent to noncompliers.

EPA Must Continue to Train and Maintain a Technically Proficient Workforce

Changes in hazardous waste management in the U.S. have been rapid and far-reaching over the last few years. As regulations have become more environmentally protective and public participation in waste management activities (especially siting) more substantial, the need for trained and experienced technical personnel has risen dramatically. While reliable quantitative evidence of a lack of personnel is lacking, anecdotal evidence for such a shortfall abounds in the form of rising private sector salaries, and increasing competition for personnel evidenced by high turnover. One indicator of growing demand is the rate of growth of hazardous waste management firms (which are engaged in both RCRA and CERCLA activities). These firms include those engaged in the transportation and disposal of waste, and those providing technical expertise in environmental exposure and risk assessment, hydrogeological assessment, and other waste-related engineering disciplines.

EPA's need for technical capability continues to rise. Just as private sector requirements for hydrogeologic and environmental assessment capability have grown, EPA requires trained personnel to review permit applications, inspect facilities, define and enforce corrective actions, and develop regulations for increasingly sophisticated waste management techniques. As much as possible, EPA has addressed the need for ongoing training and technical support through the development of detailed guidance documents. A wide range of guidance materials are now available for permit writers, inspectors, and enforcement personnel, including specific detailed guidance in the complex area of ground-water assessment. EPA has conducted a detailed Needs Assessment to define its technical capability requirements, has instituted a number of state and regional training programs (e.g., on groundwater treatment technology), and has created a Technology Transfer Task Force to assist the training program.

Information and Data Management Require Further Development

In order to track the large number of hazardous waste management facilities subject to the Subtitle C requirements, EPA developed a large information data base called the Hazardous Waste Data Management System (HWDMS). This system is designed to provide information on facility-specific characteristics (e.g., type of waste handled), as well as on permitting, inspection, and enforcement status. To date, this system has been difficult to use, and its data relatively suspect. These limitations have led to the simultaneous development of a number of use-specific companion systems that were created on an *ad hoc* basis in order to fulfill day-to-day management needs.

In part, the HWDMS problems developed because the system was created during a period when information needs were largely undefined and rapidly changing, and because states and regions had little incentive to maintain the system (either to input data in a timely manner or to verify the data). In addition, some of the information was inconsistent or unavailable (e.g., some states define hazardous waste under state law in a manner that is inconsistent with EPA).

EPA has addressed these data management problems by implementing a substantially improved version of HWDMS, by instituting new data management procedures (which make the states and regions responsible for the data inputs), and by beginning development, in an iterative fashion, of a new, more comprehensive system (RCRIS) that will be able to combine information from the several smaller databases that were created for specific functions. As a result of detailed surveys, the RCRIS system will recognize the very different information needs of states, regions, and EPA headquarters through the use of a flexible data base structure. At the same time, the accuracy and responsiveness of EPA's existing data management system has improved significantly, and can now be used to monitor program accomplishments and to develop environmental priorities more reliably.

Greater Inter-Office and Inter-Program Coordination is Necessary

As EPA's hazardous and solid waste programs have evolved, they have required an increasing degree of coordination among various offices within EPA. Coordination has become necessary in two areas in particular: implementation of RCRA and CERCLA actions, and administration of the permitting and enforcement efforts of RCRA. In the former case, a large number of CERCLA actions have resulted in substantial quantities of waste redisposal in environmentally acceptable RCRA facilities, or have required (or will require) consideration of RCRA standards for onsite waste redisposal at the CERCLA site. While not required by law, current EPA policy is to conform to RCRA standards at CERCLA sites whenever possible, and, at a minimum, to ensure that RCRA facilities receiving CERCLA waste are environmentally sound. Since RCRA facilities must be periodically inspected by EPA as part of ongoing permitting and compliance monitoring efforts, sites designated to receive CERCLA waste have been assigned a high inspection priority. EPA has also adopted an inter-media approach to identify potential problems (for example, with redisposal or treatment options), and has formed a RCRA/CERCLA work group to coordinate policy on corrective action and cleanup standards. Other issues include RCRA sites on the National Priorities List (NPL), RCRA/CERCLA off-site policy, and the potential impact of RCRA facilities that lose interim status on the CERCLA program.

Within the RCRA program, EPA has recognized that its environmental program objectives can be achieved through mechanisms that involve both permitting and enforcement procedures (e.g., by accelerating final permit determinations for noncompliers, or by issuing administrative orders that accelerate corrective actions). This interrelationship has become even more significant with the new corrective action capabilities granted to EPA under HSWA. However, it is necessary to ensure that corrective actions (which need only address compliance with interim status provisions) also satisfy final permitting conditions. In order to ensure better coordination between permitting and enforcement divisions, EPA has recently instituted a Facility Management Planning (FMP) process, whereby the treatment of each facility is planned in a coordinated fashion which includes identification of the specific "tools" EPA proposes to use at each. FMP also serves as a vehicle for monitoring EPA progress and for setting permitting and enforcement priorities.

Finally, enactment of HSWA has also brought the RCRA program closer to other environmental programs as well. Air emissions regulations are required for RCRA treatment, storage, and disposal facilities. RCRA staff must work closely with the Office of Water in addressing corrective action at publicly owned treatment works (POTW's), sludge regulations, domestic sewage exclusion and the banning of wastes from underground injection control units. Similarly, RCRA staff must coordinate activities with the Office of Pesticides and Toxic Substances in addressing PCB disposal.

Appendix A

Recent RCRA Accomplishments

Activity	Brief Description
REGULATIONS	
Waste as Fuel Administrative Standards	Final Rule. Prohibits the burning in non-industrial boilers of both hazardous waste fuel and of used oil that does not meet specification levels of certain hazardous contaminants. HSWA deadline, November 1986.
Land Disposal Restrictions - Schedule	Final Rule. Sets forth schedule for reviewing hazardous wastes to determine if they should be restricted from land disposal. HSWA deadline, November 1986.
Land Disposal Restrictions - Framework, Dioxin and Solvents	Proposed Rule. Established the framework for the land disposal restrictions program including the setting of treatment standards for hazardous wastes prior to land disposal, procedures for filing petitions for ban exemptions, criteria for setting effective dates for bans, and procedures for case-by-case effective date extensions. HSWA deadline for dioxins and solvents, November 1986.
Small Quantity Generators	Final Rule. Provided standards for wastes generated in quantities greater than 100 and less than 1,000 kg/month. HSWA deadline, March 1986.
Codification Rule - Part 1 - State Authorization	Proposed Rule. Companion rule to EPA's final rule of July 15, 1985 which identified requirements specified by HSWA which took effect immediately or shortly after enactment. This rule changes existing regulations to assist in the implementation of the new statutory provisions pertaining to authorization of State hazardous waste programs.
Codification Rule - Part 2 - Liners/Corrective Action	Proposed Rule. This rule addresses performance-based design alternatives to HSWA Section 3004(o) for double liners and leachate collection systems at land disposal units and and corrective action requirements regarding corrective action for contamination beyond the RCRA facility boundary.

Activity	Brief Description
Mining Waste Exclusion Reinterpretation	Proposed Rule. Currently all solid waste from the extraction and treating of ores and minerals are excluded from regulation as hazardous waste under RCRA. Only large volume processing wastes (e.g., bauxite muds, phosphogypsum and slags) would remain within the exclusion. Wastes removed from exclusion will be subject to Subtitle C regulation if they are hazardous. Court ordered deadline, September 1986.
Waste Oil (Used Oil) Management/Listing Standards	Proposed Rule. Provided standards to list used oil as a hazardous waste and to control used oil that is recycled. Includes controls over the generation, transportation, storage, and reuse of recyled used oil. HSWA deadline for proposed listing, November 1985; for standards, November 1986.
Hazardous Waste Export Rule	Proposed and Final Rule. Prohibits exports of hazardous waste unless prior written consent is obtained from the receiving country; a copy of the written consent is attached to the manifest and the shipment conforms to the terms of the manifest. HSWA deadline, November 1985.
Regulatory Amendments for use of Appendix 8 for Ground-Water Monitoring	Proposed Rule. Modified list of hazardous constituents referenced in the regulations for use in ground-water monitoring.
Storage or Treatment of Hazardous Waste in Tanks	Final Rule. Regulations for the proper management of tank systems storing or treating hazardous waste to control risk posed by the migration of the waste. HSWA deadline, March 1985. Court ordered deadline, June 1986.
Mining Waste Regulatory Determination	Final. Determined that regulations of wastes studied in the Report to Congress under Subtitle C is not warranted at this time. Plan to regulate under Subtitle D program with added statutory authorities. Court ordered deadline, June 1986.

Activity	Brief Description
Toxicity Characteristic	Proposed Rule. Expanded the toxicity characteristic to include approximately 38 additional organic toxicants and introduced a new extraction procedure to be used in the toxicity characteristic test. Replacement of current leaching procedure with one suitable for organic compounds. HSWA deadline for toxicity characteristic, November 1986; March 1987 for toxicity characteristic leaching.
90-day Accumulator Tank Systems	Announcement of advanced Proposed Rulemaking. Proposes options for requiring owners of tanks accumulating wastes for less than 90 days to comply with corrective action authorities under RCRA.
REPORTS	
Mining Waste Report to Congress	Comprehensive assessment of possible adverse effects on human health and the environment from the disposal and utilization of solid wastes from the extraction and treatment of ores and minerals. Metal, phosphate, and abestos mining segments of the U.S. mining industry were included in the assessment.
GUIDANCES	
FY 1987 RCRA Implementation Plan	Established the framework for determining priorities and guidance at the national and State levels for implementation of the RCRA Subtitle C program.
Nonhazardous Liquids	Provided guidance to Regions, States, and owners and operators about prohibition/demonstration of placement of nonhazardous liquids in hazardous waste landfills.
Bulk Liquids	Provided interpretation of and guidance on the statutory requirements for bulk hazardous liquids so that owners/operators can comply with RCRA regulations.

Activity	Brief Description
Surface Impoundment Retrofitting	Guidance for owners and operators of existing surface impoundments who wish to seek an exemption from the retrofitting requirements.
IMPLEMENTATION ACTIVITIES	
Granted Final Authorization to 15 States	Delegated the pre-HSWA program to the following States: Kansas, Nevada, South Carolina, Arizona, Missouri, Guam, Pennsylvania, Illinois, Oregon, Rhode Island, Washington, Wisconsin, New York, and West Virginia. This brings the total number of States authorized to forty-one.
Public Involvement Training Course	Conducted training in ten regions for permit writers to involve the public in Agency decision making particularly for obtaining informed consent in the permitting of hazardous waste facilities.
Incinerator Permit Program Study	Conducted a study of the incinerator permit program. Objectives were to develop accurate list of incinerator facilities; and determine the priority of incinerators being permitted in the Regions and the length of time to issue these permits.
Technical Assistance to the Regions	Provided direct assistance to the Regions/States on specific permit questions concerning technical or policy issues holding up permit issuance. Permit Assistance Teams (PATs) are formed using program and other headquarters staff to provide comments on selected land disposal, incineration, and storage permit actions.
Mixed Wastes - State Authorization	Federal Register Notice. Announced that States can apply for authorization to regulate radioactive mixed wastes, i.e., wastes that contain both RCRA wastes and source, special nuclear, or byproduct material waste subject to the Atomic Energy Act.
RCRA Orientation Manual	Provided general information on the RCRA hazardous waste program including an overview, the extent of its coverage, and the way it works.

Activity	Brief Description
Mobile Treatment Units (MTUs) Study	Conducted a study to determine the feasibility of procedures to expedite the permitting of mobile treatment units.
Implementation Strategies	In conjunction with regulatory development activities, developed implementation strategies that outline the schedule for implementation, issues associated with implementation of regulatory actions, and the specific tasks and activities needed to implement a particular rule or guidance document. Completed strategy for small quantity generator rulemaking.
HSWA Authorization For One State	Federal Register Notice. Provided tentative approval of revision to Georgia's hazardous waste program including HSWA requirements through July 15, 1985.
Published Nine Delisting Petitions Notices	Federal Register Notice. Published nine notices covering 202 delisting actions to grant or deny requests for removal of certain wastes from the hazardous waste listing program.

Appendix B

Guidance Documents

1983-1985

1983 GUIDANCE DOCUMENTS

DOCUMENT TITLE	DESCRIPTION
Permit Applicants' Gudiance Manual for the General Facility Standards	Guidance for permit applicants addressing general information requirements of 270.14 (b)(1-12,19) and the 264 standards referenced by those requirements
Permit Writer's Guidance Manual for Hazardous Waste Tanks	General information on design, standards and operation for tanks
Guidance Manual for Hazardous Waste Incinerator Permits	Presents specifications to comply with incineration regulation. For use by both permit writers and applicants
RCRA Permit Writers' Manual for Ground Water Protection (40 CFR Part 264 F)	Technical document to be used by both permit writers and applicants
Hazardous Waste Land Treatment	Technical resource document for permit applicants and writers
Draft RCRA Guidance Document: Land Treatment	For permit applicants Presents specifications to comply with the Part 264 Land Disposal Standards
Permit Writers' Guidance Manual for Hazardous Waste Land Treatment, Storage, and Disposal Facilities (2 volumes)	Technical resource document for permit writers and applicants
Landfills and Surface Impoundments Performance Evaluation	Technical resource document for permit applicants and writers
Lining of Waste Impoundments and Disposal Facilities	Technical resource document for permit applicants and writers

1983 GUIDANCE DOCUMENTS (con't)

DOCUMENT TITLE	DESCRIPTION
Evaluation of Closure and Post-Closure Care Plans for Hazardous Waste Landfills	Technical resource document for permit applicants and writers
Permit Writers' Guide for Storage Facility Permits	Instructions for permit writers; Contains checklist and technical references list

1984 GUIDANCE DOCUMENTS

DOCUMENT TITLE	DESCRIPTION
Waste Analysis Plan Guidance Manual	Details specific guidance on how to prepare and evaluate Waste Analysis Plans; required as part of Part B permit application
Test Methods for Evaluating Solid Waste, 2nd edition	Technical information on testing of hazardous Wastes for all applicants; Updated on a regular basis; Current update package contains methods for use in ground-water monitoring & incinerator performance measurements.
Designed and Development of Hazardous Waste Reactivity Testing Protocol	Test scheme (protocol) including field test kit, flow diagrams to determine gross chemical composition of waste materials in the field; used to classify waste into reactivity groups and thus, predict compatibility
Permit Applicants' (PA) Gudance Manual Land Treatment, Storage, and Disposal Facilities	Similar concept as the storage PA's guide; emphasizes use of TRD series
Procedures for Modeling Flow Through Clay Liners to Determine Required Liner Thickness	Technical resources document for permit applicants and writers

1984 GUIDANCE DOCUMENTS (con't)

DOCUMENT TITLE	DESCRIPTION
The Hydrologic Evaluation Landfill Performance (HELP) Model (2 vols)	Technical resource document for permit applicants and writers
Solid Waste Leaching Procedure Manual	Technical resource document for permit applicants and writers
Soil Properties, Classification, and Hydraulic Conductivity Testing	Technical resource document for permit applicants and writers
Data Management Strategy for RCRA Ground-Water Monitoring Data Using STORET	Strategy document for use of STORET for ground-water monitoring data
Model Permit	Companion to Permit Writers' Guide; Boilerplate language and modules for different types of permit conditions

1985 GUIDANCE DOCUMENTS

DOCUMENT TITLE	DESCRIPTION
Guidance for the Analysis of Refinery Wastes	Analytical and quality control guidance for refinery waste samples
Petitions to Delist Hazardous Waste; A Guidance Manual	Addresses vast amount of information required to submit delisting petitions by persons who generate or manage listed wasted
Asbestos Waste Management Guidance; Generation, Transport, and Disposal	Summary of information on asbestos quantities and uses, generation, transport disposal, cost of handling, and Federal regulatory programs
RCRA Preliminary Assessment/Site Investigation Guidance	Draft guidance on implemnting §3004(u) and § 3008(h)
Draft Guidance Document for Research, Development, and Demonstration Permits under 40 CFR Section 270.65	For permit applicants and writers; recommends information to consider in preparing permit applications and in drafting permit conditions; for evaluating proposals and issuing RD&D permit
Guidance for Implementing the RCRA Dioxin Listing Rule	Guidance ot accompany Dioxin Listing Rule; Addresses implementation issues
Statutory Interpretive Guidance--Treatment of Bulk Hazardous Liquid	Treatment methods acceptable to company with the May 8, 1985 statutory prohibition
Directory of Commercial Hazardous Waste Treatment and Recycling Facilities	Cross-reference hazardous waste treatment and recycling facilities with types of waste handled
Model Permit Application for Existing Incinerators	For use of both permit writers and applicants
Permit Guidance Manual on Hazardous Waste Land Treatment Demonstrations	Permit guidance manual for permit applicants and writers

1985 GUIDANCE DOCUMENTS (con't)

DOCUMENT TITLE	DESCRIPTION
Permit Guidance Manual on Unsaturated Zone Monitoring for Hazardous Waste Land Treatment Units	Permit guidance manual for permit applicants and writers
Permit Writers' Guidance Manual for Hazardous Waste Land Storage and Disposal Facilities--Phase I: Criteria for Location Acceptability and Existing Applicable Regulations	For Permit writers; Presents five criteria for acceptable location of storage and disposal facilities
Method for the Storage and Retrieval of RCRA Ground-Water Monitoring Data on STORET	Guidance on use of STORET for ground-water monitoring
Alternate Concentration Limit Guidance Based on §264.94(b) Criteria Part I	Information required in alternate concentration limit demonstrations
Draft Guidance on Implementation of the Minimum Technological Requirements of HSWA of 1984, Respecting Liners Leachate Collection Systems	Applicability, notification, good faith compliance and variances for the minimum technological requirements in Sections 3004(o) and 3015
Draft Minimum Technology Guidance on Double Liner Systems for Landfills and Surface Impoundments --Design, Construction and Operation	Detailed technical guidance on double liner systems
Draft Minimum Technology Guidance on Single Liner Systems for Landfills, Surface Impoundments, and Waste Piles--Design Construction and Operation	Detailed technical guidance on single liner systems
Construction Quality Assurance for Hazardous Waste Land Disposal Facilities	Guidance on the Following components of the QA/QC program: dikes, soil liners, flexible membrane liners, anf final covers

1985 GUIDANCE DOCUMENTS (con't)

DOCUMENT TITLE	DESCRIPTION
Permit Applicants' Guidance Manual for Exposure Information Requirements under RCRA Section 3019	Provides guidance to owners and operators of landfills and surface impoundments for submitting information on potential for public exposure to hazardous waste as required by RCRA Section 3019
Restriction on the Placement of Nonhazardous Liquids in Hazardous Waste Landfills	Provides guidance on HSWA Section 3004(c)(3) which prohibits the disposal of nonhazardous liquids in landfills; Information on exemptions/demonstrations
RCRA Ground-Water monitoring Technical Enforcement Guidance Document	Technical enforcemnt guidance regarding appropriate design and implementation of ground-water monitoring at RCRA interim status facilities
Practical Guide for Ground-Water Sampling	File report on 2-year study related to ground-water sampling procedures, monitoring well construction